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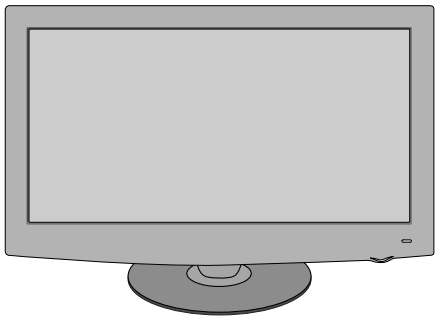
LCD TV
SERVICE MANUAL

CHASSIS : LA92C

MODEL : 47LH90 47LH90-UB

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL58600434 (0904-REV00)

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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Exploded View.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1W), keep the resistor 10mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

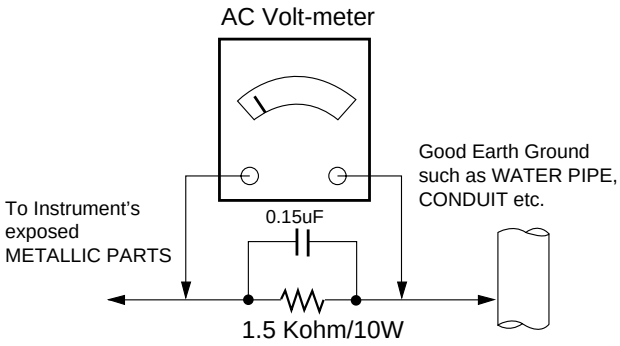
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1MΩ and 5.2MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)
Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.
Connect 1.5K/10watt resistor in parallel with a 0.15uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the *SAFETY PRECAUTIONS* on page 3 of this publication.
NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.
   Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) isopropyl alcohol (90%-99% strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. *Use with this receiver only the test fixtures specified in this service manual.*
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called *Electrostatically Sensitive (ES) Devices.* Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500°F to 600°F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature. (500°F to 600°F)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500°F to 600°F)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This specification is applied to the 42” LCD TV used LA92C chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

1) Temperature: 25±5ºC
2) Relative Humidity: 65±10%
3) Power Voltage : Standard input voltage(100-240V~, 50/60Hz)
   * Standard Voltage of each product is marked by models
4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
5) The receiver must be operated for about 20 minutes prior to the adjustment.

3. Test method

1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety: UL, CSA, IEC specification
   - EMC: FCC, ICES, IEC specification

4. General Specification(TV)

No	Item	Specification		Remark
1.	Receiving System	1) ATSC / NTSC-M		
2.	Available Channel	1) VHF : 02~13 2) UHF : 14~69 3) DTV : 02-69 4) CATV : 01~135 5) CADTV : 01~135		
3.	Input Voltage	1) AC 100 ~ 240V 50/60Hz		Mark : 110V, 60Hz : USA 220V, 60Hz : KOR
4.	Market	NORTH AMERICA		55LH90-UB 47LH90-UB 42LH90-UB
		KOREA		55LH90QD-NA 47LH90QD-NA 42LH90QD-NA
5.	Screen Size	55 inch Wide(1920 108 0)	FHD	55LH90-UB / 55LH90QD-NA
		47 inch Wide(1920 108 0)	FHD	47LH90-UB / 47LH90QD-NA
		42 inch Wide(1920 108 0)	FHD	42LH90-UB / 42LH90QD-NA
6.	Aspect Ratio	16:9		
7.	Tuning System	FS		
8.	Module	LC550WUL-SBM1	LGD	55LH90-UB / 55LH90QD-NA
		LC470WUL-SBM1	LGD	47LH90-UB / 47LH90QD-NA
		LC420WUL-SBM1	LGD	42LH90-UB / 42LH90QD-NA
9.	Operating Environment	1) Temp : 0 ~ 40 deg 2) Humidity : ~ 80 %		
10.	Storage Environment	1) Temp : -20 ~ 60 deg 2) Humidity : ~ 85 %		

5. Chrominance & Luminance Specification

No	Item			Min	Typ	Max	Unit	Remark
1.	White peak brightness (Center 1-point / Full White Pattern)			400	500		cd/m	47LH90-UB / 47LH90QD-NA
2.	White average brightness						cd/m	N/A
3.	Brightness uniformity			77			%	Full white
4.	Color coordinate	RED	X	Typ. -0.03	0.649	Typ. +0.03		Color Coordinate **측정** Mode : PC PSM : **편안한 영상** CSM : **표준**
5.			Y		0.323			
6.		GREEN	X		0.290			
7.			Y		0.637			
8.		BLUE	X		0.147			
9.			Y		0.057			
10.		WHITE	X		0.279			
11.			Y		0.292			
12.	Color coordinate uniformity							N/A
13.	Contrast ratio Dynamic CR			900:1 1,800,000:1	1300:1 2,000,000:1			Local Dimming ON (RGB/HDMI-PC 9P7')
14.	Color Temperature	Cool	x	0.261	0.276	0.291		<Test Condition> 85% Full white pattern
			y	0.268	0.283	0.298		
		Medium	x	0.270	0.285	0.398		
			y	0.278	0.293	0.308		
		Warm	x	0.298	0.313	0.328		
			y	0.314	0.329	0.344		
15.	Color Distortion, DG					10.0	%	
16.	Color Distortion, DP					10.0	deg	
17.	Color S/N, AM/FM			43.0			dB	
18.	Color Killer Sensitivity			-80			dBm	

6. Component Video Input (Y, PB, PR)

No	Resolution	H-freq(kHz)	V-freq.(kHz)	Pixel clock	Proposed
1.	720*480	15.73	60	13.5135	SDTV ,DVD 480I
2.	720*480	15.73	59.94	13.5	SDTV ,DVD 480I
3.	720*480	31.50	60	27.027	SDTV 480P
4.	720*480	31.47	59.94	27.0	SDTV 480P
5.	1280*720	45.00	60.00	74.25	HDTV 720P
6.	1280*720	44.96	59.94	74.176	HDTV 720P
7.	1920*1080	33.75	60.00	74.25	HDTV 1080I
8.	1920*1080	33.72	59.94	74.176	HDTV 1080I
9.	1920*1080	67.500	60	148.50	HDTV 1080P
10.	1920*1080	67.432	59.939	148.352	HDTV 1080P
11.	1920*1080	27.000	24.000	74.25	HDTV 1080P
12.	1920*1080	26.97	23.976	74.176	HDTV 1080P
13.	1920*1080	33.75	30.000	74.25	HDTV 1080P
14.	1920*1080	33.71	29.97	74.176	HDTV 1080P

7. RGB input (PC)

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	
	PC					DDC
1.	640*350	31.468	70.09	25.17	EGA	X
2.	720*400	31.469	70.08	28.32	DOS	O
3.	640*480	31.469	59.9	25.17	VESA(VGA)	O
4.	800*600	37.879	60.31	40.00	VESA(SVGA)	O
5.	1024*768	48.363	60.00	65.00	VESA(XGA)	O
6.	1280*768	47.776	59.870	79.5	CVT(WXGA)	X
7.	1360*768	47.712	60.015	85.50	VESA (WXGA)	X
8.	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
9.	1600*1200	75.00	60.00	162	VESA (UXGA)	O
10.	1920*1080	66.587	59.934	138.5	HDTV 1080P	O

8. HDMI input (PC/DTV)

8.1 PC Mode

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1	640*350	31.468	70.09	25.17	EGA	X
2	720*400	31.469	70.08	28.32	DOS	O
3	640*480	31.469	59.94	25.17	VESA(VGA)	O
4	800*600	37.879	60.31	40.00	VESA(SVGA)	O
5	1024*768	48.363	60.00	65.00	VESA(XGA)	O
6	1280*768	47.776	59.870	79.5	CVT(WXGA)	X
7	1360*768	47.712	60.015	85.50	VESA (WXGA)	X
8	1280*1024	63.981	60.020	108.00	VESA (SXGA)	O
9	1600*1200	75.00	60.00	162	VESA (UXGA)	O
10	1920*1080	67.5	60	148.5	HDTV 1080P	O

8.2 DTV Mode

No	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed
1	720*480	31.47	60	27.027	SDTV 480P
2	720*480	31.47	59.94	27.00	SDTV 480P
3	1280*720	45.00	60.00	74.25	HDTV 720P
4	1280*720	44.96	59.94	74.176	HDTV 720P
5	1920*1080	33.75	60.00	74.25	HDTV 1080I
6	1920*1080	33.72	59.94	74.176	HDTV 1080I
7	1920*1080	67.500	60	148.50	HDTV 1080P
8	1920*1080	67.432	59.939	148.352	HDTV 1080P
9	1920*1080	27.000	24.000	74.25	HDTV 1080P
10	1920*1080	26.97	23.94	74.176	HDTV 1080P
11	1920*1080	33.75	30.000	74.25	HDTV 1080P
12	1920*1080	33.71	29.97	74.176	HDTV 1080P

ADJUSTMENT INSTRUCTION

1. Application Object

This specification sheet applied to LA92C Chassis applied LCD TV all models manufactured in TV factory.

2. Notes

(1) Because this is not a hot chassis, it is not necessary to use an isolation transformer. However, the use of isolation transformer will help protect test equipment.
(2) Adjustments must be done in the correct order.
(3) The adjustments must be performed in the circumstance of 20±5°C of temperature and 65±10% of relative humidity if there is no specific designation.
(4) The input voltage of the receiver be must kept 100V-240V, 50/60Hz when adjusting.
(5) The receiver must be operated for about 5 minutes prior to the adjustment when module is in the circumstance of over 15.
In case of keeping module is in the circumstance of 0°C, it should be placed in the circumstance of above 15°C for 2 hours
In case of keeping module is in the circumstance of below -20°C, it should be placed in the circumstance of above 15°C for 3 hours,.

Caution : When still image is displayed for a period of 20 minutes or longer (especially where W/B scale is strong. Digital pattern 13ch and/or Cross hatch pattern 09ch), there can some afterimage in the black level area.

3. Adjustment items

3.1 Board-level adjustment

- Adjust 480i Comp1 adj.(Comp1080i & RGB Adjust use internal pattern)
- EDID/DDC download

Above adjustment items can be also performed in Final Assembly if needed. Both Board-level and Final assembly adjustment items can be check using In-Star Menu 1.ADJUST CHECK.

3.2. Final assembly adjustment

- White Balance adjustment
- RS-232C functionality check
- Factory Option setting per destination
- Ship-out mode setting (In-Stop)

3.3 Etc

- Ship-out mode
- Service Option Default
- USB Download(S/W Update, Option, Service only)

4. Board-level adjustment

4.1. ADC Adjustment

(1) Overview
ADC adjustment is needed to find the optimum black level and gain in Analog-to-Digital device and to compensate RGB deviation.

(2) Equipment & Condition
1) Jig (RS-232C protocol)
2) Input : MSPG-925FS(Model : 209 ,Pattern : 65, Only component))
3) RGB Adjust use internal pattern.

(3) Adjustment
1) Adjustment method
- Using RS-232, adjust items listed in 3.1 in the other shown in “4.1.3.3”

2) Adj. protocol

Protocol	Command	Set ACK
Enter adj. mode	aa 00 00	a 00 OK00x
Begin adj.	ad 00 10	
Return adj. result		OKx (Case of Success) NGx (Case of Fail)
Read adj. data	(main) ad 00 20	(main) 00000000000000000000000007c007b006dx
	(sub) ad 00 21	(Sub) 00000007000000000000000007c00830077x
Confirm adj.	ad 00 99	NG 03 00x (Fail) NG 03 01x (Fail) NG 03 02x (Fail) OK 03 03x (Success)
End adj.	aa 00 90	a 00 OK90x

Ref.) ADC Adj. RS232C Protocol_Ver1.0

3) Adj. order
- ad 00 00 [Enter ADC adj. mode]
- ad 00 10 [Adjust 480i Comp1]
- ad 00 90 End adj.

4.2 EDID(The Extended Display Identification Data) / DDC(Display Data Channel) download

4.2.1 Overview

It is a VESA regulation. A PC or a MNT will display an optimal resolution through information sharing without any necessity of user input. It is a realization of “Plug and Play”.

4.2.2 Equipment

• Adj. R/C
• Since embedded EDID data is used, EDID download jig, HDMI cable and D-sub cable are not need.

4.2.3 Download method

1) Press Adj. key On the Adj. R/C, press Adj. key then select EDID D/L. By pressing Enter key, EDID download will begin.
2) If Download is successful, OK is displayed.
3) If Download is a failure, NG is displayed.
4) Re-try download.

4.2.4 EDID DATA

•Reference: Download is only possible in POWER ON MODE.

HDMI I [C/S: 1DCA]

EDID Block 0, Bytes 0-127 [00H-7FH]

Block Type: EDID 1.3

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	02	00	01	01	01	01
0x01	01	13	01	03	80	73	41	78	0A	CF	74	A3	57	4C	B0	23
0x02	09	48	4C	A1	08	00	A9	40	81	80	61	40	45	40	31	40
0x03	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
0x04	45	00	7E	8A	42	00	00	1E	01	1D	00	72	51	D0	1E	20
0x05	6E	28	55	00	7E	8A	42	00	00	1E	00	00	00	FD	00	39
0x06	3E	1E	52	10	00	0A	20	20	20	20	20	20	00	00	00	FC
0x07	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	1D

EDID Block 1, Bytes 128-255 [80H-FFH]

Block Type: CEA EDID Timing Extension Version 3

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x08	02	03	1F	F1	47	10	22	20	05	84	03	02	26	15	07	50
0x09	09	07	07	67	03	0C	00	10	00	88	2D	E3	05	03	01	02
0x0A	3A	80	18	71	38	2D	40	58	2C	04	05	7E	8A	42	00	00
0x0B	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	7E	8A	42
0x0C	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	7E
0x0D	8A	42	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96
0x0E	00	7E	8A	42	00	00	18	26	36	80	A0	70	38	1F	40	30
0x0F	20	25	00	7E	8A	42	00	00	1A	00	00	00	00	00	00	CA

· HDMI II [C/S: 1DBA]

EDID Block 0, Bytes 0-127 [00H-7FH]

Block Type: EDID 1.3

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	02	00	01	01	01	01
0x01	01	13	01	03	80	73	41	78	0A	CF	74	A3	57	4C	B0	23
0x02	09	48	4C	A1	08	00	A9	40	81	80	61	40	45	40	31	40
0x03	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
0x04	45	00	7E	8A	42	00	00	1E	01	1D	00	72	51	D0	1E	20
0x05	6E	28	55	00	7E	8A	42	00	00	1E	00	00	00	FD	00	39
0x06	3F	1F	52	10	00	0A	20	20	20	20	20	20	00	00	00	FC
0x07	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	1D

EDID Block 1, Bytes 128-255 [80H-FFH]

Block Type: CEA EDID Timing Extension Version 3

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x08	02	03	1F	F1	47	10	22	20	05	84	03	02	26	15	07	50
0x09	09	07	07	67	03	0C	00	20	00	88	2D	E3	05	03	01	02
0x0A	3A	80	18	71	38	2D	40	58	2C	04	05	7E	8A	42	00	00
0x0B	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	7E	8A	42
0x0C	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	7E
0x0D	8A	42	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96
0x0E	00	7E	8A	42	00	00	18	26	36	80	A0	70	38	1F	40	30
0x0F	20	25	00	7E	8A	42	00	00	1A	00	00	00	00	00	00	BA

· HDMI III [C/S: 1DAA]

EDID Block 0, Bytes 0-127 [00H-7FH]

Block Type: EDID 1.3

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	02	00	01	01	01	01
0x01	01	13	01	03	80	73	41	78	0A	CF	74	A3	57	4C	B0	23
0x02	09	48	4C	A1	08	00	A9	40	81	80	61	40	45	40	31	40
0x03	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
0x04	45	00	7E	8A	42	00	00	1E	01	1D	00	72	51	D0	1E	20
0x05	6E	28	55	00	7E	8A	42	00	00	1E	00	00	00	FD	00	39
0x06	3F	1F	52	10	00	0A	20	20	20	20	20	20	00	00	00	FC
0x07	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	1D

EDID Block 1, Bytes 128-255 [80H-FFH]

Block Type: CEA EDID Timing Extension Version 3

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x08	02	03	1F	F1	47	10	22	20	05	84	03	02	26	15	07	50
0x09	09	07	07	67	03	0C	00	10	00	88	2D	E3	05	03	01	02
0x0A	3A	80	18	71	38	2D	40	58	2C	04	05	7E	8A	42	00	00
0x0B	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	7E	8A	42
0x0C	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	7E
0x0D	8A	42	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96
0x0E	00	7E	8A	42	00	00	18	26	36	80	A0	70	38	1F	40	30
0x0F	20	25	00	7E	8A	42	00	00	1A	00	00	00	00	00	00	AA

· HDMI IV [C/S: 1D9A]
EDID Block 0, Bytes 0-127 [00H-7FH]
Block Type: EDID 1.3

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	02	00	01	01	01	01
0x01	01	13	01	03	80	73	41	78	0A	CF	74	A3	57	4C	B0	23
0x02	09	48	4C	A1	08	00	A9	40	81	80	61	40	45	40	31	40
0x03	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
0x04	45	00	7E	8A	42	00	00	1E	01	1D	00	72	51	D0	1E	20
0x05	6E	28	55	00	7E	8A	42	00	00	1E	00	00	00	FD	00	39
0x06	3F	1F	52	10	00	0A	20	20	20	20	20	20	00	00	00	FC
0x07	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	01	1D

EDID Block 1, Bytes 128-255 [80H-FFH]
Block Type: CEA EDID Timing Extension Version 3

	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
0x08	02	03	1F	F1	47	10	22	20	05	84	03	02	26	15	07	50
0x09	09	07	07	67	03	0C	00	10	00	88	2D	E3	05	03	01	02
0x0A	3A	80	18	71	38	2D	40	58	2C	04	05	7E	8A	42	00	00
0x0B	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00	7E	8A	42
0x0C	00	00	9E	01	1D	00	72	51	D0	1E	20	6E	28	55	00	7E
0x0D	8A	42	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96
0x0E	00	7E	8A	42	00	00	18	26	36	80	A0	70	38	1F	40	30
0x0F	20	25	00	7E	8A	42	00	00	1A	00	00	00	00	00	00	9A

· RGB [C/S: 36]
EDID Block 0, Bytes 0-127 [00H-7FH]
Block Type: EDID 1.3

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	02	00	01	01	01	01
10	01	13	01	03	68	73	41	78	0A	CF	74	A3	57	4C	B0	23
20	09	48	4C	A1	08	00	A9	40	81	80	61	40	45	40	31	40
30	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
40	45	00	7E	8A	42	00	00	1E	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	7E	8A	42	00	00	1E	00	00	00	FD	00	39
60	3F	1F	52	10	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4C	47	20	54	56	0A	20	20	20	20	20	20	20	00	36

*After Board level adjustment, set volume setting value 0

5.3. White Balance Adjustment

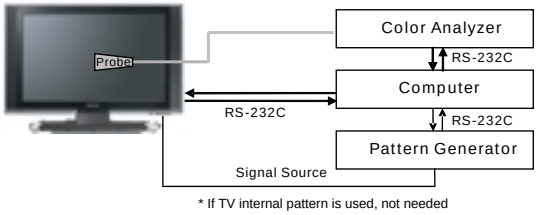
(1) Overview
- W/B adj. Objective & How-it-works
  - Objective: To reduce each Panel's W/B deviation
  - How-it-works: When R/G/B gain in the OSD is at 192, it means the panel is at its Full Dynamic Range. In order to prevent saturation of Full Dynamic range and data, one of R/G/B is fixed at 192, and the other two is lowered to find the desired value.

(2) Equipment
1) Color Analyzer : CA-210 (White LED Module : CH14/NCG : CH 9 / WCG: CH12)
2) Adj. Computer (During auto adj., RS-232C protocol is needed)
3) Adjust Remocon
4) Video Signal Generator MSPG-925F 720p/216Gray (Model:217, Pattern:78)
   -> Only when internal pattern is not available

• Color Analyzer Matrix should be calibrated using CS-1000

(3) Equipment connection MAP

(4) Equipment connection map



Connection Diagram of Automatic Adjustment

(5) Adj. Command (Protocol)

•RS-232C Command used during auto-adj.

RS-232C COMMAND [CMD	ID	DATA]	Meaning
wb	00	00	Begin White Balance adj.
wb	00	ff	End White Balance adj.(Internal pattern disappeared)

Ex) ld 00 00 -> Aging Time
wb 00 00 -> Begin white balance auto-adj.
wb 00 10 -> Gain adj.
ja 00 ff -> Adj. data
jb 00 c0
...
...
wb 00 1f -> Gain adj. complete
*(wb 00 20(Start), wb 00 2f(End)) -> Off-set adj.
wb 00 ff -> End white balance auto-adj.

(6) Adjustment Map

	ITEM	Command		Data Range (Hex.)		Default (Decimal)
		Cmd 1	Cmd 2	Min	Max	
Cool	R-Gain	j	g	00	C0	
	G-Gain	j	h	00	C0	
	B-Gain	j	i	00	C0	
	R-Cut					
	G-Cut					
	B-Cut					
Medium	R-Gain	j	a	00	C0	
	G-Gain	j	b	00	C0	
	B-Gain	j	c	00	C0	
	R-Cut					
	G-Cut					
	B-Cut					
Warm	R-Gain	j	d	00	C0	
	G-Gain	j	e	00	C0	
	B-Gain	j	f	00	C0	
	R-Cut					
	G-Cut					

(5) Adj. method

• Auto adj. method

1) Set TV in adj. mode using POWER ON key
2) Zero calibrate probe then place it on the center of the Display
3) Connect Cable(RS-232C)
4) Select mode in adj. Program and begin adj.
5) When adj. is complete (OK Sing), check adj. status pre mode (Warm, Medium, Cool)
6) Remove probe and RS-232C cable to complete adj.

* W/B Adj. must begin as start command “wb 00 00”, and finish as end command “wb 00 ff”, and Adj. offset if need

• Manual adj. method

1) Set TV in Adj. mode using POWER ON
2) Zero Calibrate the probe of Color Analyzer, then place it on the center of LCD module within 10cm of the surface..
3) Press ADJ key -> EZ adjust using adj. R/C > 6. White-Balance then press the cursor to the right (KEY G).
(When KEY(G) is pressed 216 Gray internal pattern will be displayed)
4) One of R Gain / G Gain / B Gain should be fixed at 192, and the rest will be lowered to meet the desired value.
5) Adj. is performed in COOL, MEDIUM, WARM 3 modes of color temperature.

- If internal pattern is not available, use RF input. In EZ Adj. menu 6.White Balance, you can select one of 2 Test-pattern: ON, OFF. Default is inner(ON). By selecting OFF, you can adjust using RF signal in 216 Gray pattern.

* Adj. condition and cautionary items

1) Lighting condition in surrounding area
Surrounding lighting should be lower 10 lux. Try to isolate adj. area into dark surrounding.
2) Probe location
- LCD: Color Analyzer (CA-210) probe should be within 10cm and perpendicular of the module surface (80°~ 100°)
3) Aging time
- After Aging Start, Keep the Power ON status during 5 Minutes.
- In case of LCD, Back-light on should be checked using no signal or Full-white pattern.

(6) Reference (White Balance Adj. coordinate and color temperature)

• Luminance: 216 Gray
• 42/47/55LH90-UB
• standard color coordinate and temperature using CS-1000

Mode	Color Coordination		Temp	ΔUV
	x	y		
COOL	0.276	0.283	11000K	0.0000
MEDIUM	0.285	0.293	9300K	0.0000
WARM	0.313	0.329	6500K	0.0000

5.4 Option selection per country

(1) Overview

- Option selection is only done for models in Non-USA North America due to rating
- Applied model: LA92C Chassis applied None USA model(CANADA, MEXICO)

(2) Method

1) Press ADJ key on the Adj. R/C, then select Country Group Menu
2) Depending on destination, select KR or US, then on the lower Country option, select US, CA, MX. Selection is done using +, - KEY

5.5 EYE-Q function check

Step 1) Turn on TV
Step 2) Press EYE key of Adj. R/C
Step 3) Cover the Eye Q II sensor on the front of the using your hand and wait for 6 seconds
Step 4) Confirm that R/G/B value is lower than 10 of the “Raw Data (Sensor data, Back lignt)” . If after 6 seconds, R/G/B value is not lower than 10, replace Eye Q II sensor
Step 5) Remove your hand from the Eye Q II sensor and wait for 6 seconds
Step 6) Confirm that “ok” pop up.
If change is not seen, replace Eye Q II sensor

[step2] [step3] [step4]

[step5] [step6]

5.6 Ship-out (Default) mode check (Instop)

• After final inspection, press In-Stop key of the Adj. R/C and check that the unit goes to Stand-by mode.

6. GND and Internal Pressure check

6.1. Method

1) GND & Internal Pressure auto-check preparation
   - Check that Power Cord is fully inserted to the SET. (If loose, re-insert)
2) Perform GND & Internal Pressure auto-check
   - Unit fully inserted Power cord, Antenna cable and A/V arrive to the auto-check process.
   - Connect D-terminal to AV JACK TESTER
   - Auto CONTROLLER(GWS103-4) ON
   - Perform GND TEST
   - If NG, Buzzer will sound to inform the operator.
   - If OK, changeover to I/P check automatically. (Remove CORD, A/V form AV JACK BOX)
   - Perform I/P test
   - If NG, Buzzer will sound to inform the operator.
   - If OK, Good lamp will lit up and the stopper will allow the pallet to move on to next process.

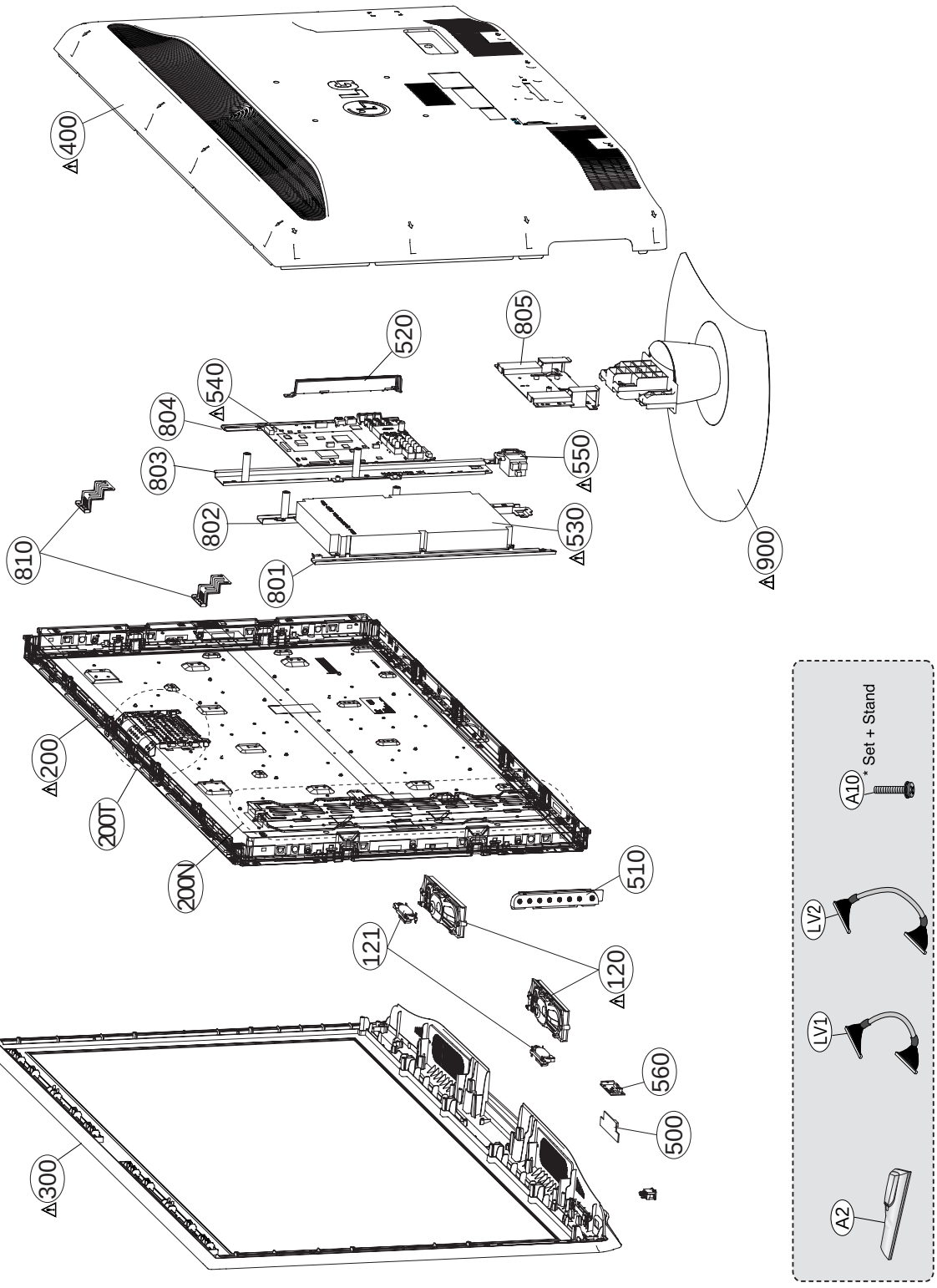
6.2. Checkpoint

• TEST voltage
  - GND: 1.5KV/min at 100mA
  - SIGNAL: 3KV/min at 100mA
• TEST time: 1 second
• TEST POINT
  - GND TEST = POWER CORD GND & SIGNAL CABLE METAL GND
  - Internal Pressure TEST = POWER CORD GND & LIVE & NEUTRAL
• LEAKAGE CURRENT: At 0.5mArms

EXPLODED VIEW

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and EXPLODED VIEW.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.



SMD Gasket Option

GAS1 SMD_Gasket MDS61887701
GAS2 SMD_Gasket MDS61887701
GAS3 SMD_Gasket MDS61887701
GAS4 SMD_Gasket MDS61887701
GAS5 SMD_Gasket MDS61887701

for FRC one-board

	GPIO12	GPIO14
Non M+S LVDS	LOW	LOW
M+S 42" Mini LVDS	LOW	HIGH
M+S 47" Mini LVDS	HIGH	LOW
M+S 37" Mini LVDS	HIGH	HIGH

IC801
LGE7329A

XTAL 12MHz
M_XTALO 008:P27 — X800 — M_XTALI 008:P27
C800 20pF, C801 20pF

SPI FLASH
IC800 W25X20AVSNIG
M_SPI_CZ 008:Y11, M_SPI_DO 008:Y10, M_SPI_CK 008:Y9, M_SPI_DI 008:Y11
R801 56, R802 56, R803 10K, R806 56, R807 56, C802 0.1uF

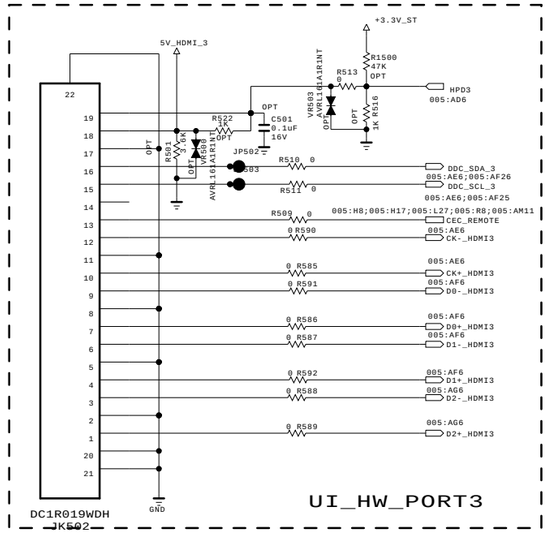
	GPIO8	PWM1	PWM0
I2C	HIGH	LOW	HIGH
EEPROM	HIGH	HIGH	LOW
SPI	HIGH	HIGH	HIGH

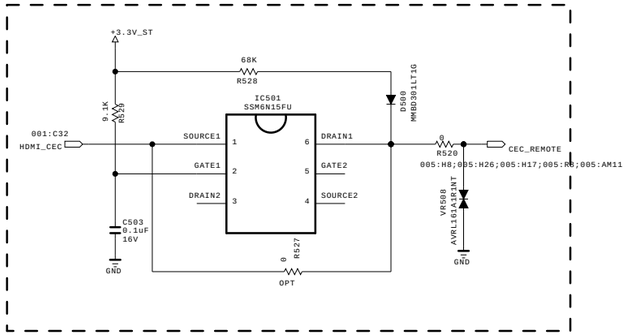
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LGElectronics

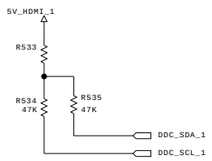
KIM SUNG KYEONG(FRC)
PARK SUNG WON(LVDS)
LG ELECTRONICS

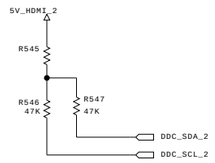
MODEL	Mstar(JUPITER)	DATE	08.11.19
BLOCK	LVDS / FRC	SHEET	7 / 15

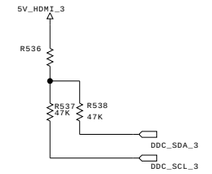


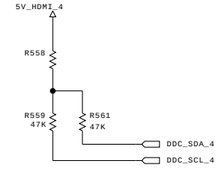


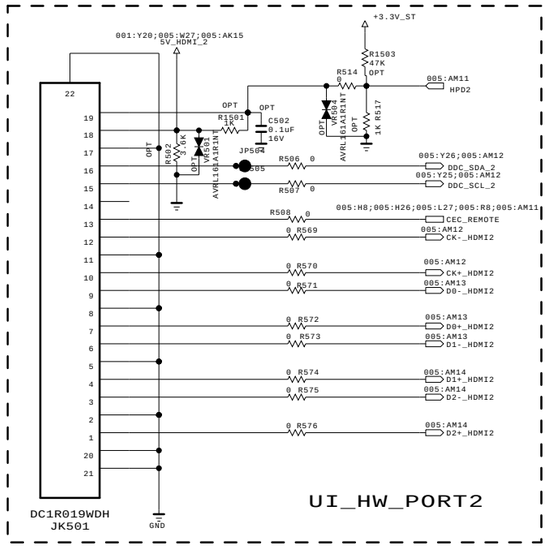
VARISTORS(VR500/501/502/503/504/505/506/507) on lines-HPD1/2/3/4 are all options in case HDMI Switch doesn't support 'ESD protection'

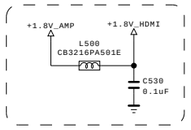


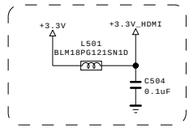


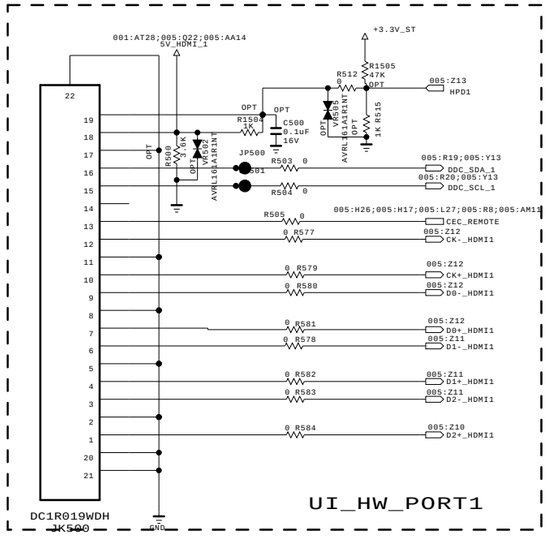


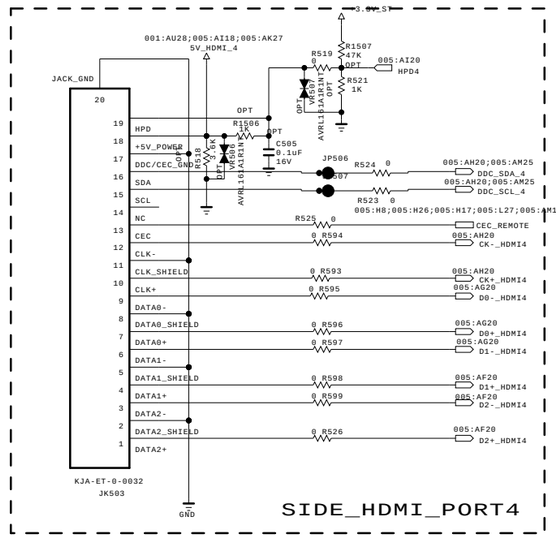


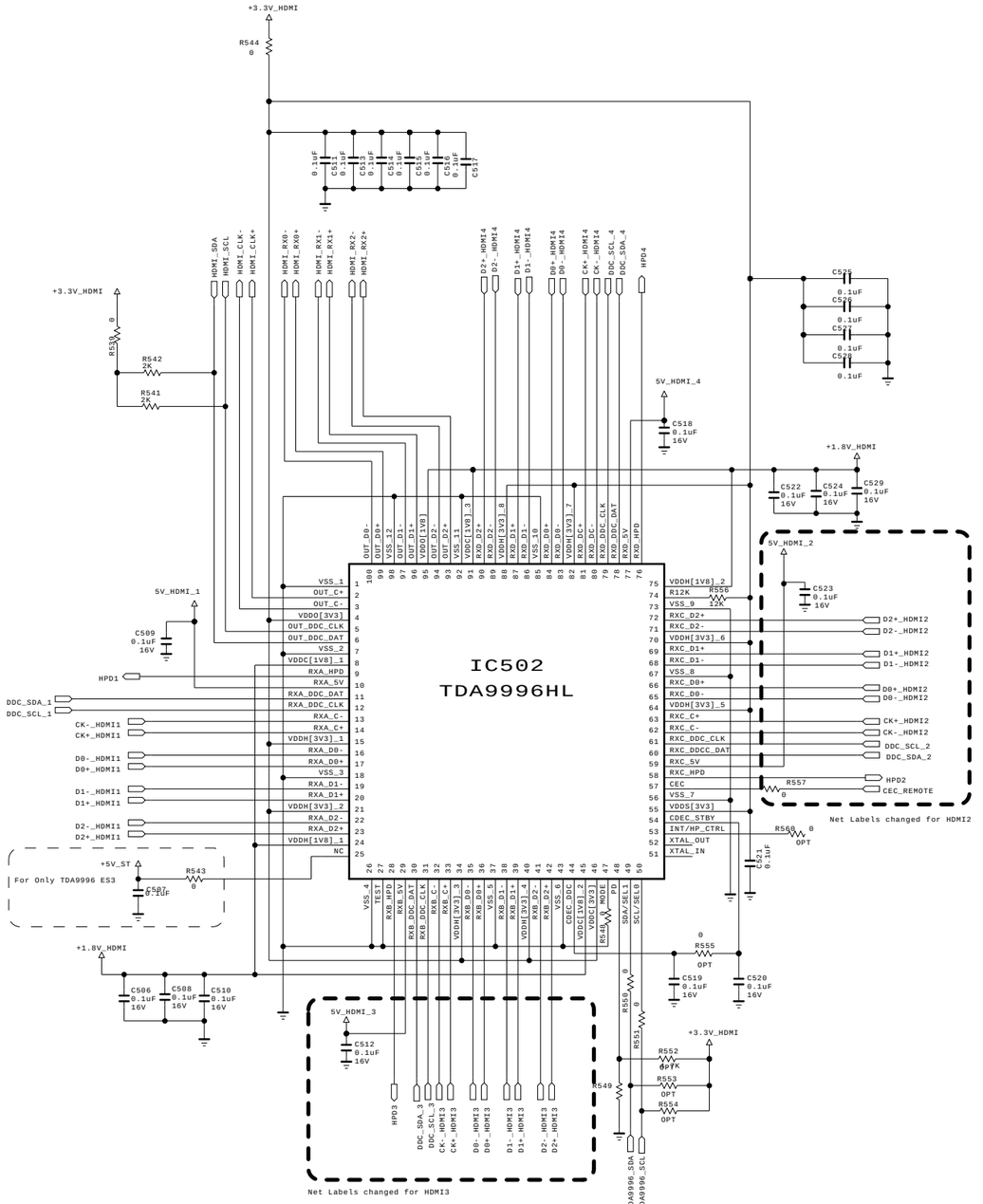












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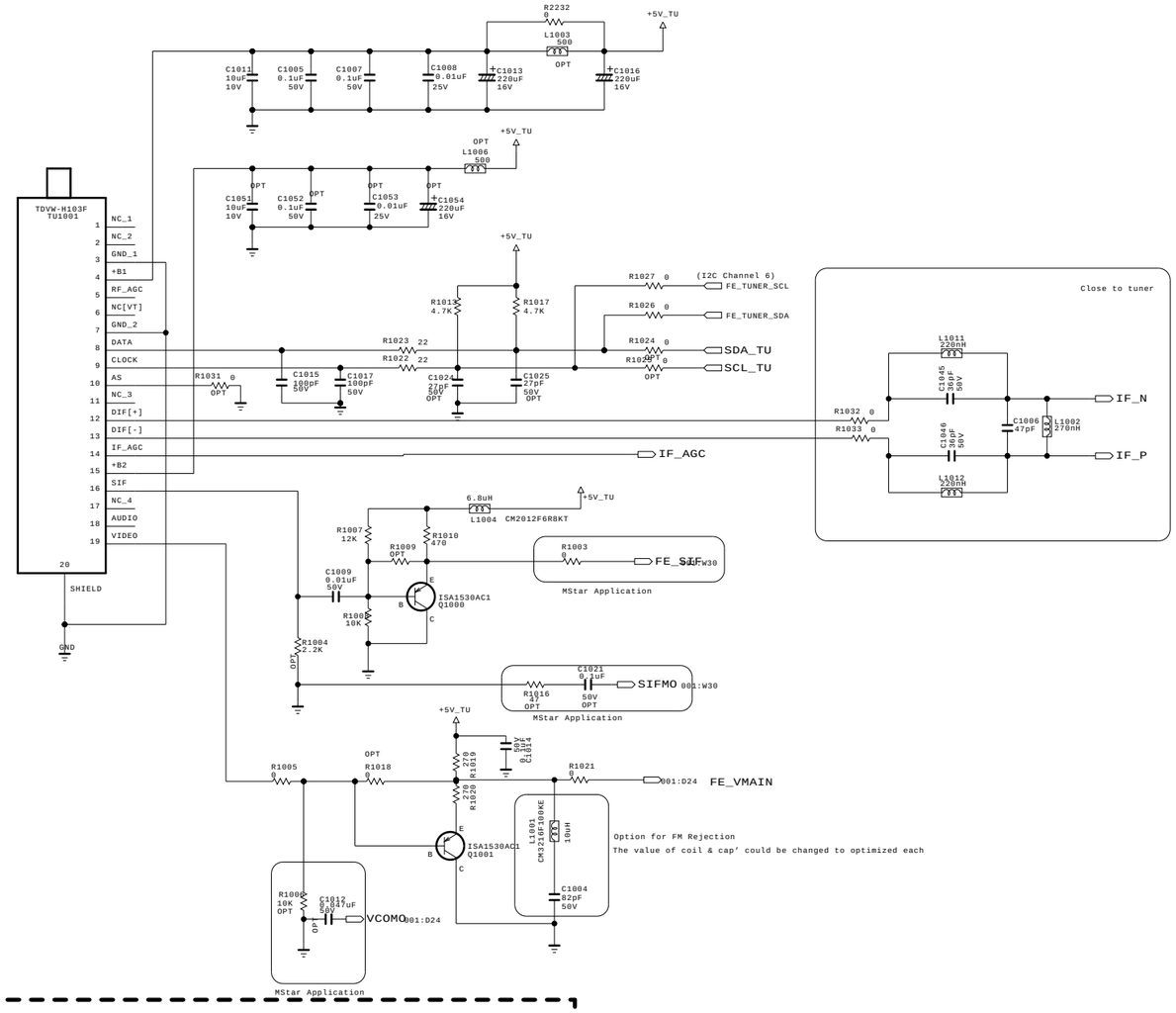
SECRET

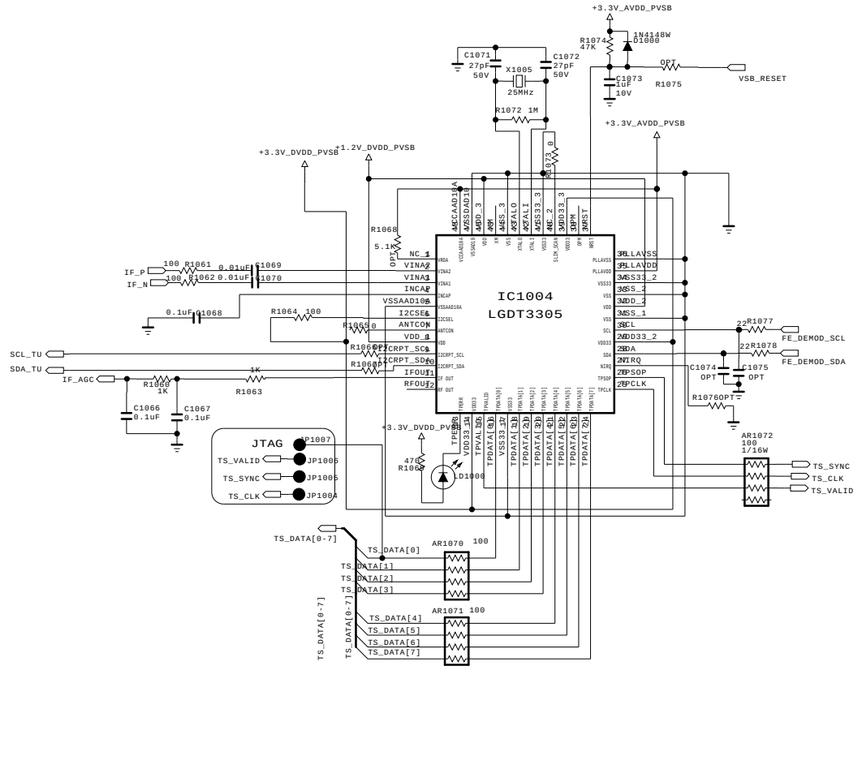
LGElectronics

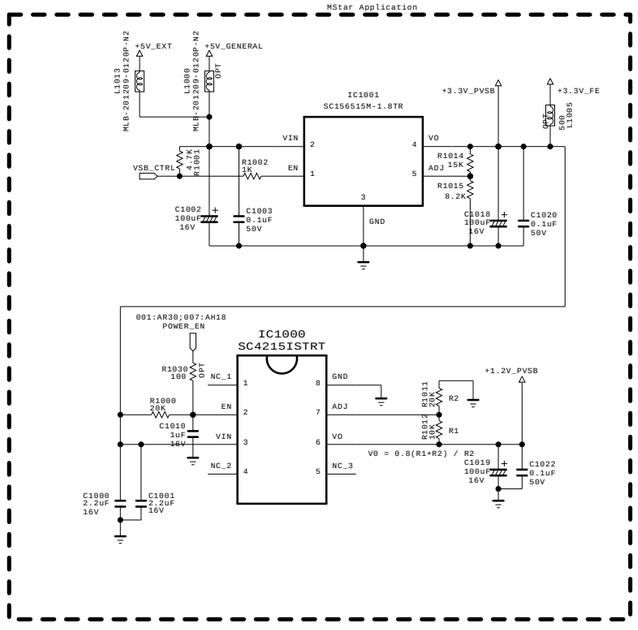
LEE GI YOUNG

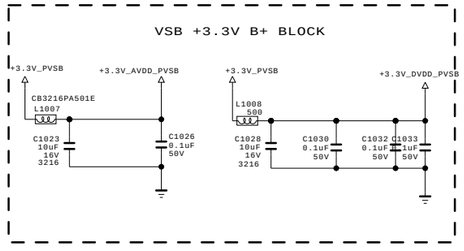
LG ELECTRONICS

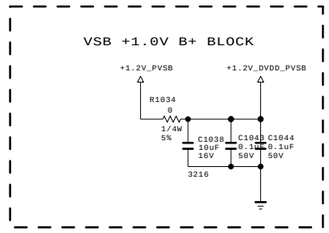
MODEL	Mstar(JUPITER)	DATE	08.11.19
BLOCK	HDMI	SHEET	2 / 15

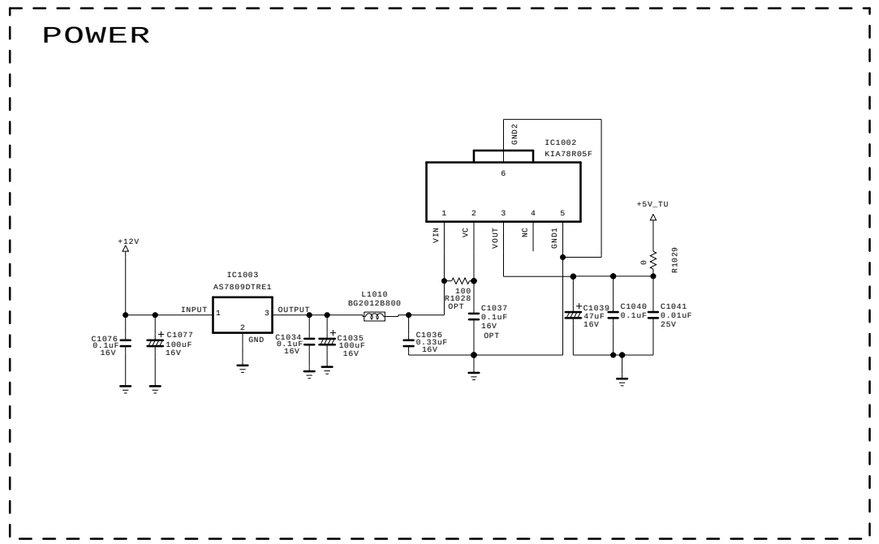












THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET

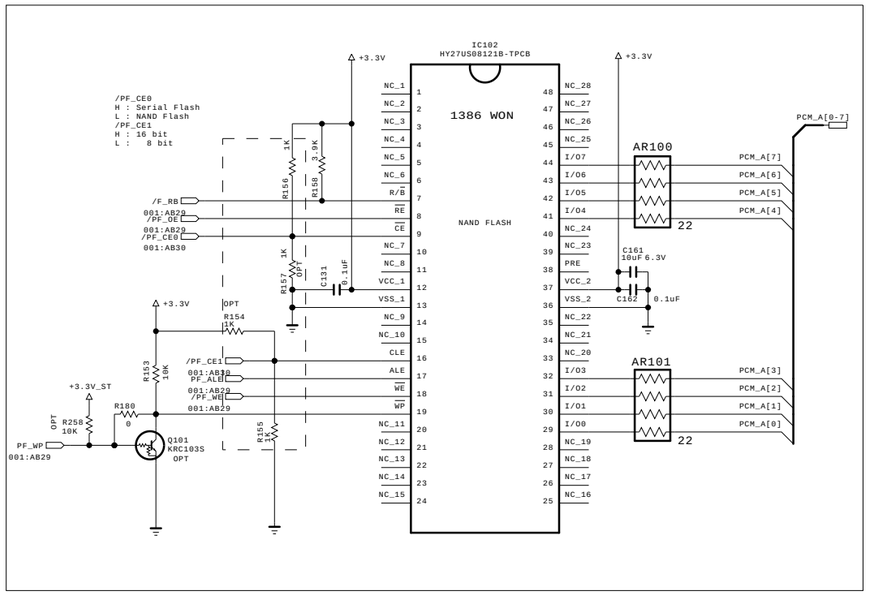
LGElectronics

HA JAE MIN

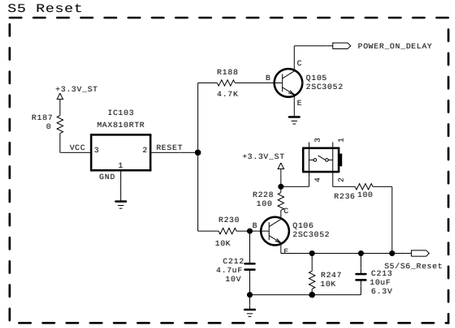
LG ELECTRONICS

MODEL	Mstar(JUPITER)	DATE	08.11.19
BLOCK	TUNER	SHEET	5 / 15

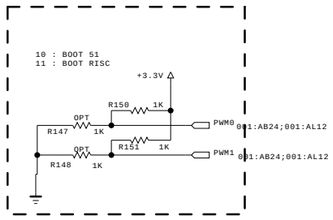
NAND FLASH MEMORY



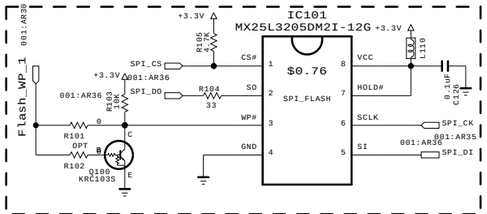
S5 Reset



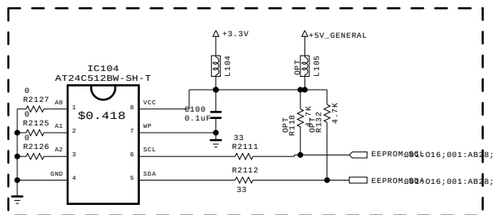
MCU BOOT STRAP



Serial FLASH MEMORY for BOOT

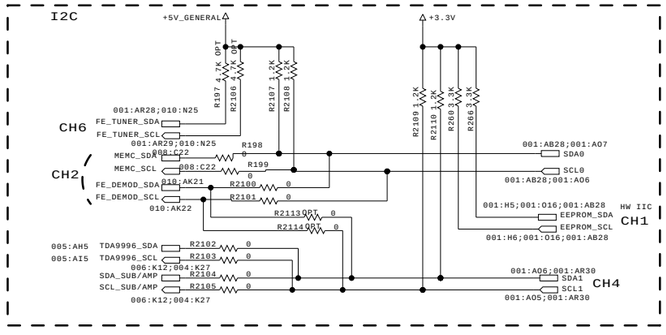


EEPROM

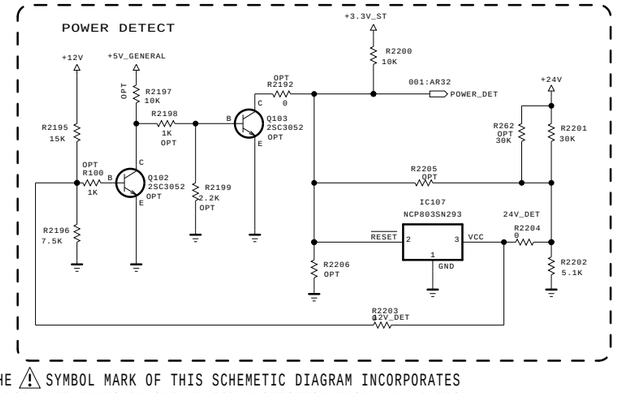


HDCP EEPROM

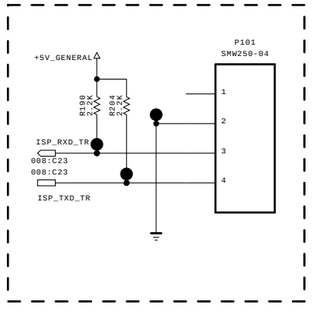
I2C



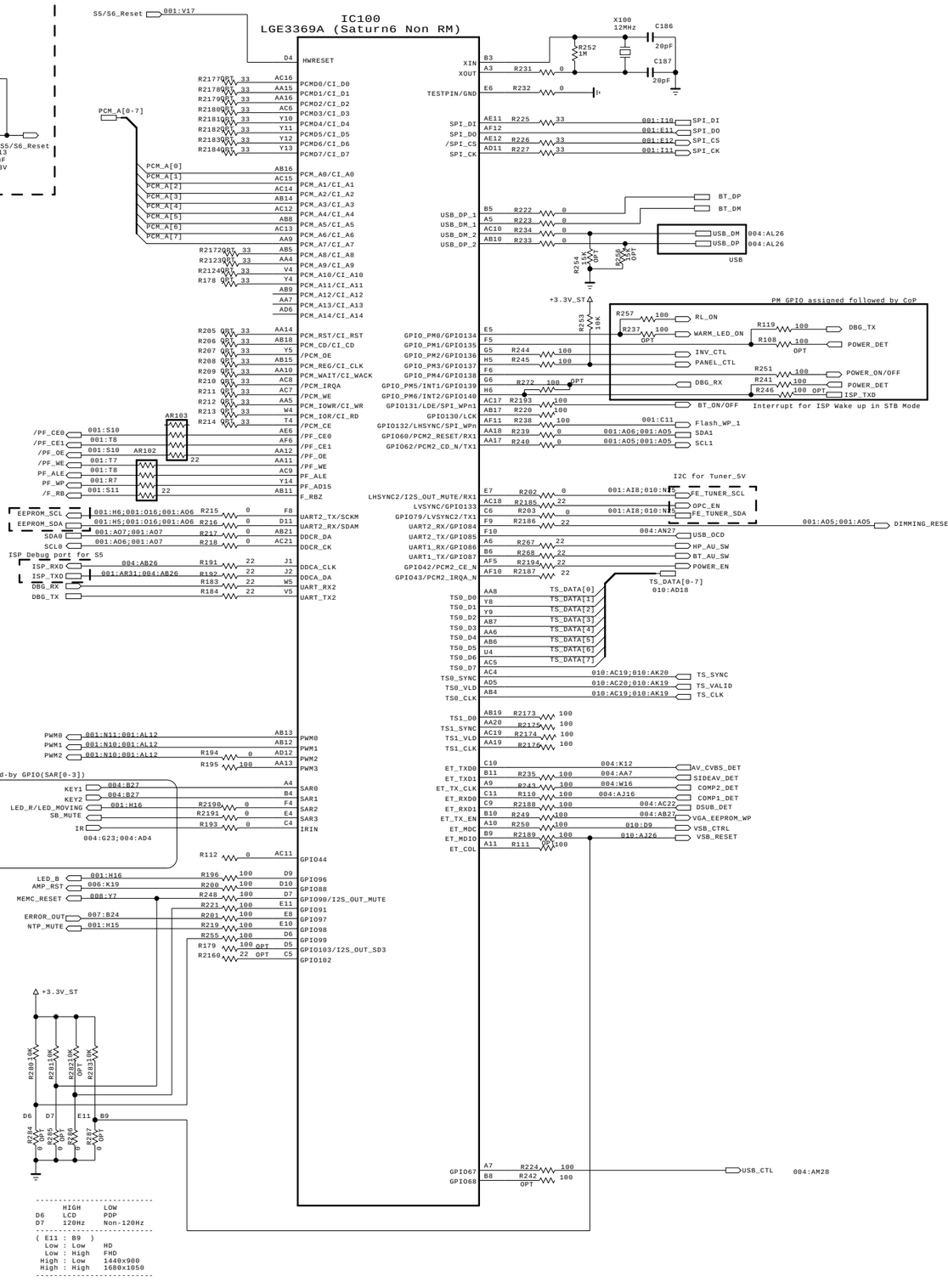
POWER DETECT



ISP Port for Triton & MEMC



IC100 LGE3369A (Saturn6 Non RM)



	HIGH	LOW
D6	LCD	PDP
D7	120Hz	Non-120Hz

(E11 : B9)
Low : Low HD
Low : High FHD
High : Low 1440x900
High : High 1680x1050

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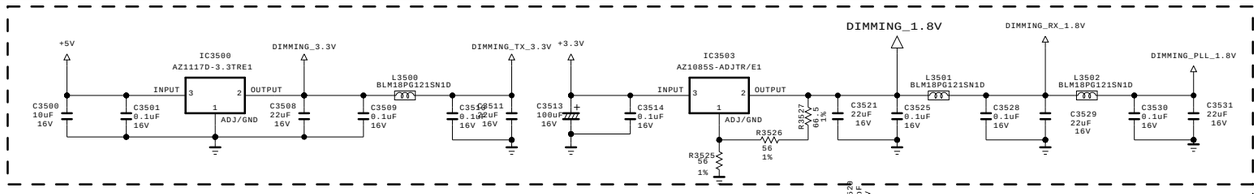
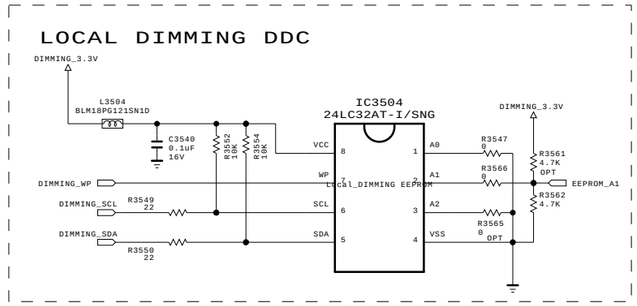
SECRET
LGElectronics

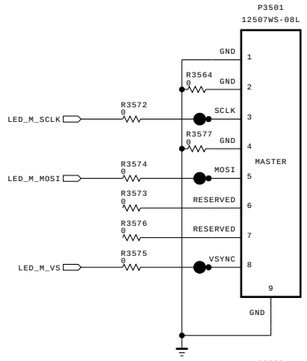
KIM SUNG KYEONG

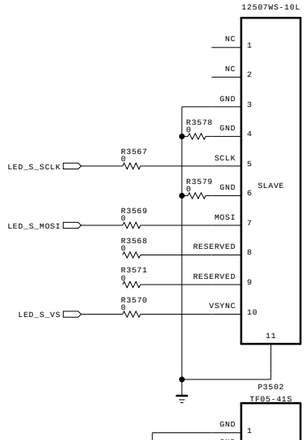
LG ELECTRONICS

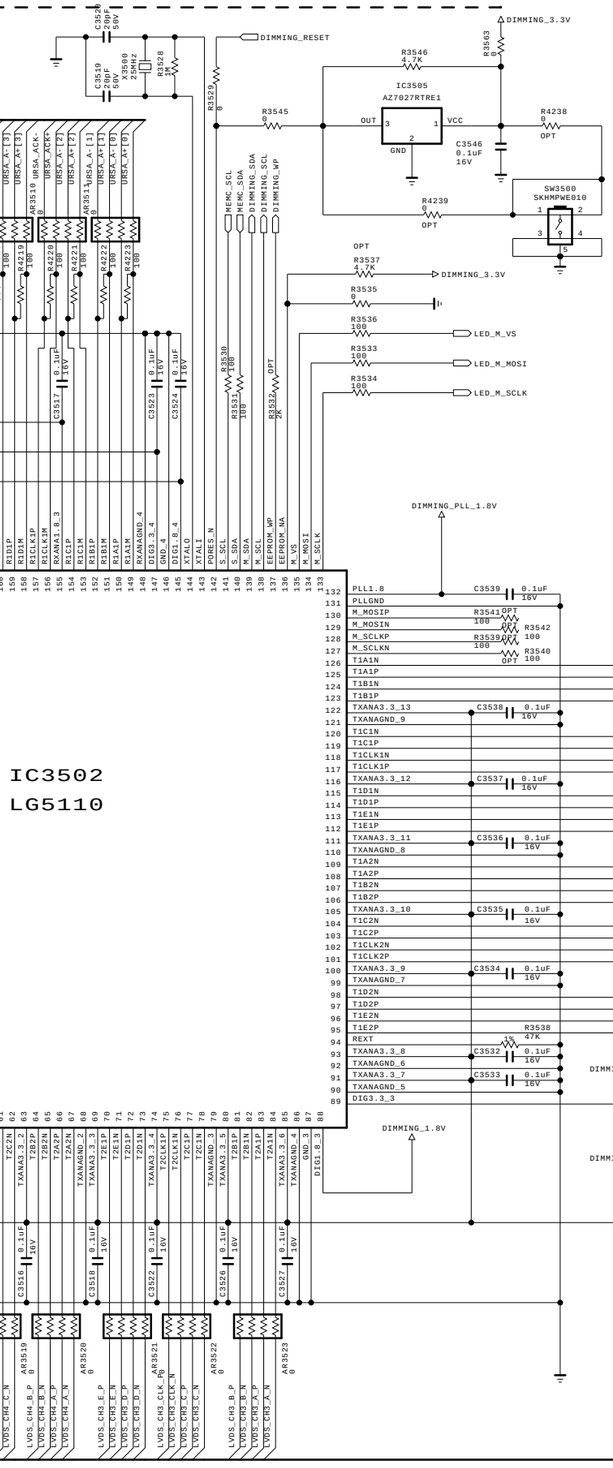
MODEL	Mstar(JUPITER)	DATE	08.11.19
BLOCK	MAIN IC	SHEET	9 / 15

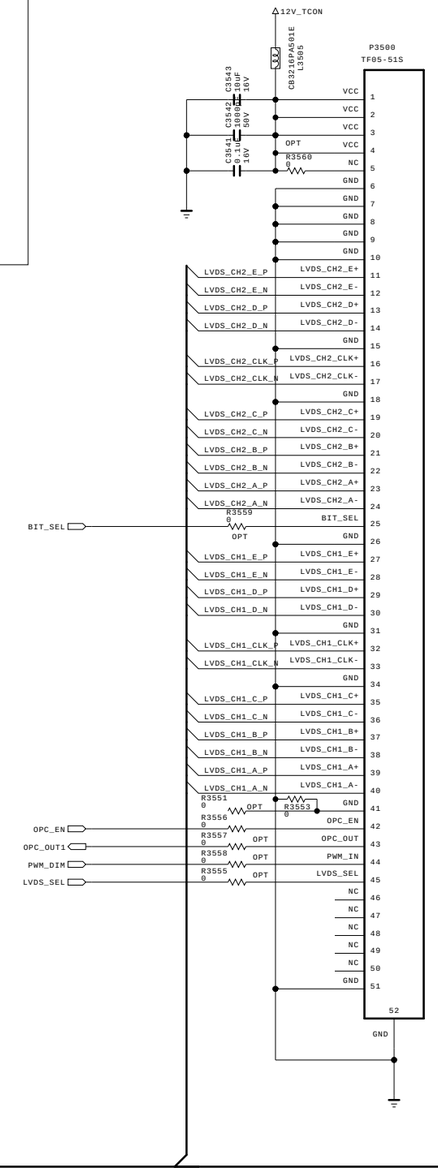












SMD Gasket

GAS6 SMD_USE_47 MDS61887701
GAS7 SMD_Gasket MDS61887701
GAS8 SMD_USE_42 MDS61887701
GAS9 SMD_Gasket MDS61887701
GAS10 SMD_Gasket MDS61887701

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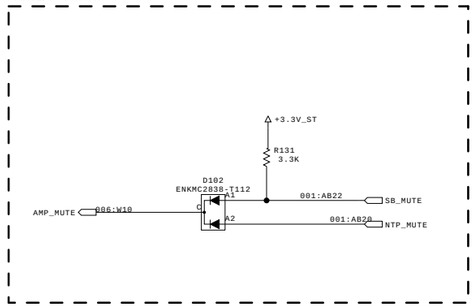
SECRET
LGElectronics

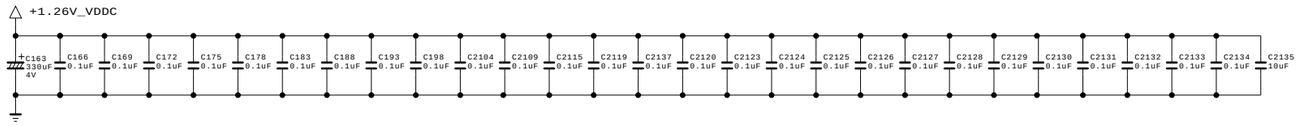
DO JAE GEUN LG ELECTRONICS

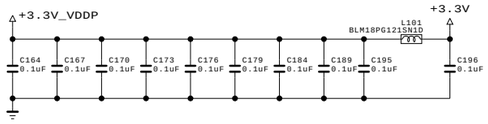
MODEL	Mstar (JUPITER)	DATE	08.11.19
BLOCK	LOCAL DIMMING	SHEET	15/15

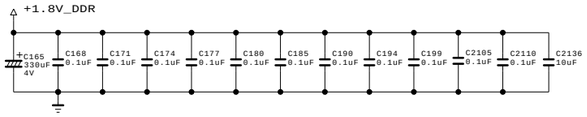
PWM Dimming

Audio Mute

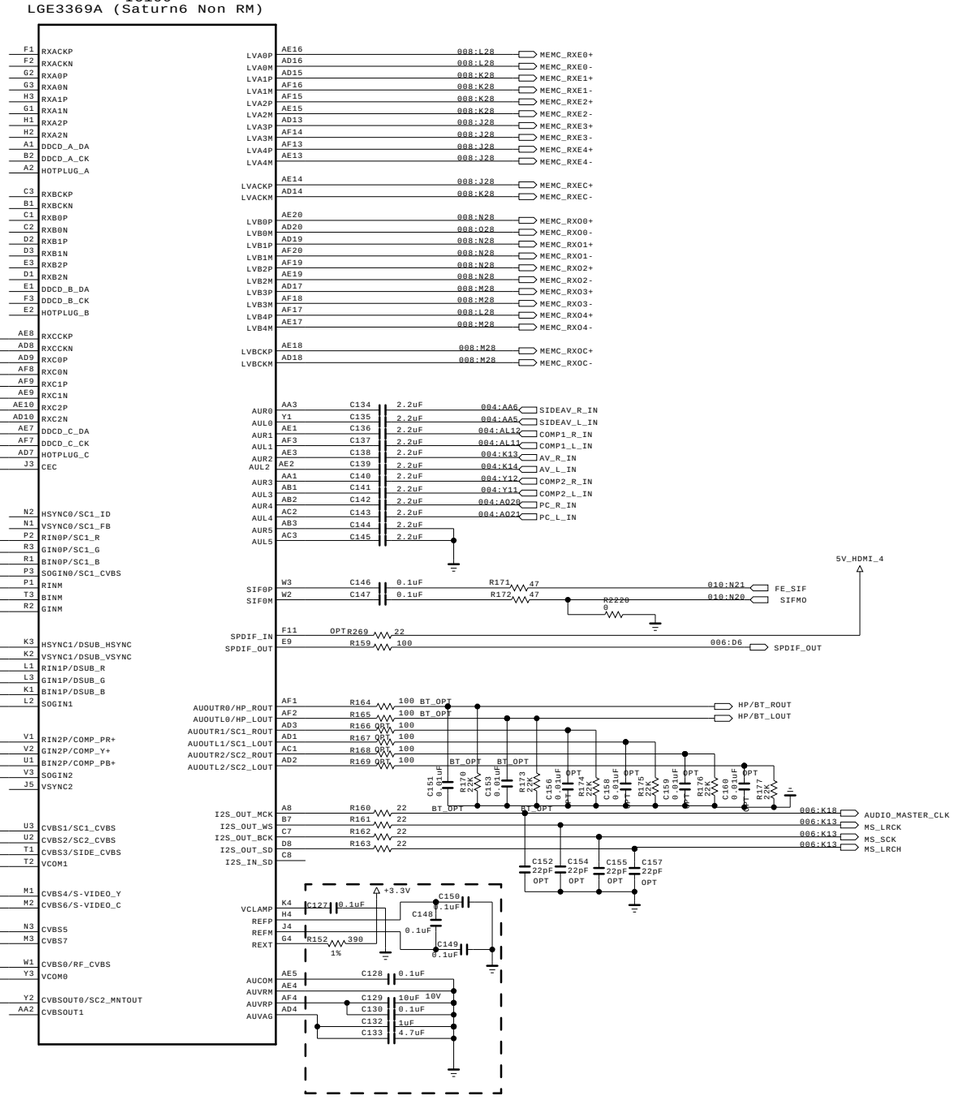








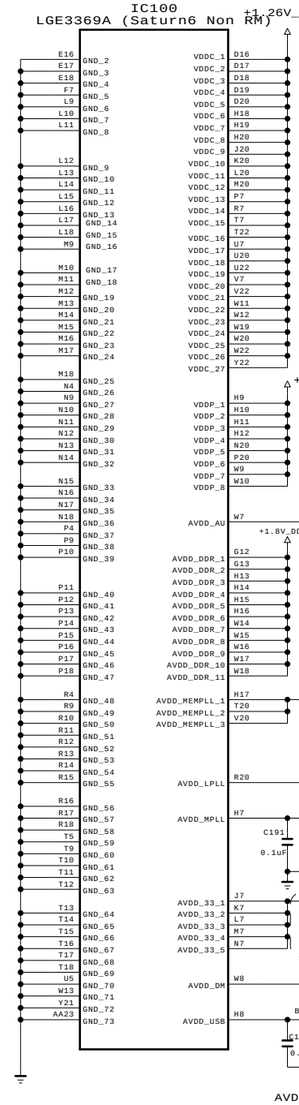
IC100
LGE3369A (Saturn6 Non RM)



Close to IC
as close as possible

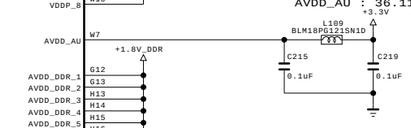
IC100
LGE3369A (Saturn6 Non RM)

+1.26V_VDDC VDDC : 970mA

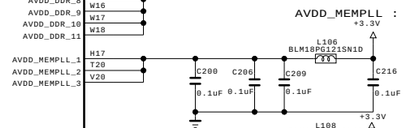


+3.3V_VDDP VDDP : 102.3mA

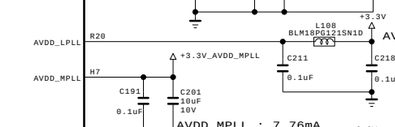
AVDD_AU : 36.11mA



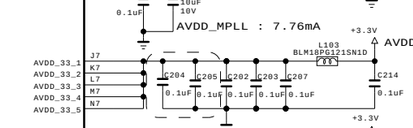
AVDD_MEMPLL : 23.77mA



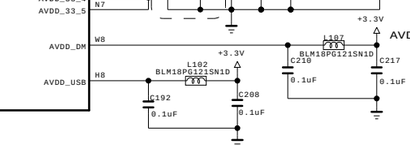
AVDD_LPLL : 4.69mA



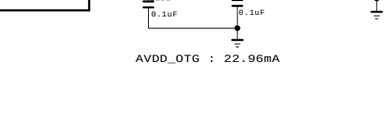
AVDD_MPLL : 7.76mA



AVDD_33 : 281mA



AVDD_DM : 0.03mA



AVDD_OTG : 22.96mA

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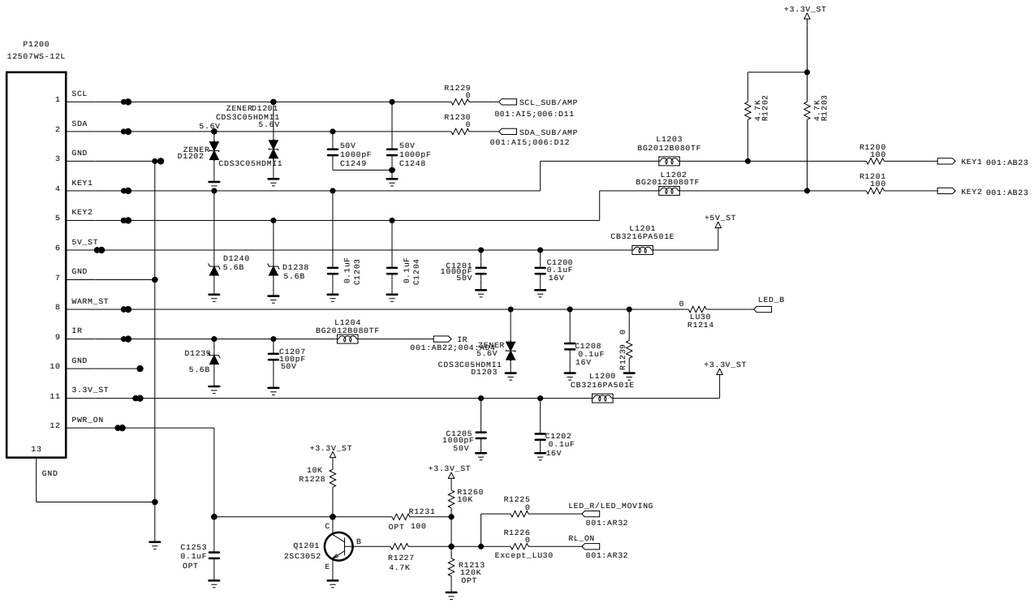
SECRET
LGElectronics

KIM SUNG KYEONG

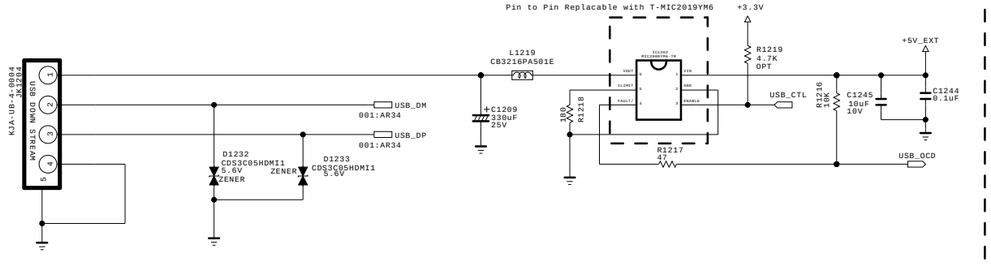
LG ELECTRONICS

MODEL	Mstar(JUPITER)	DATE	08.11.19
BLOCK	MAIN IC	SHEET	10 / 15

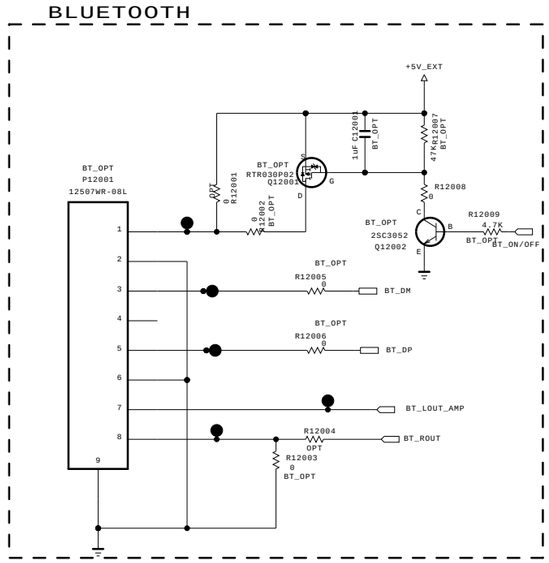
[CONTROL IR & LED]



USB



BLUETOOTH



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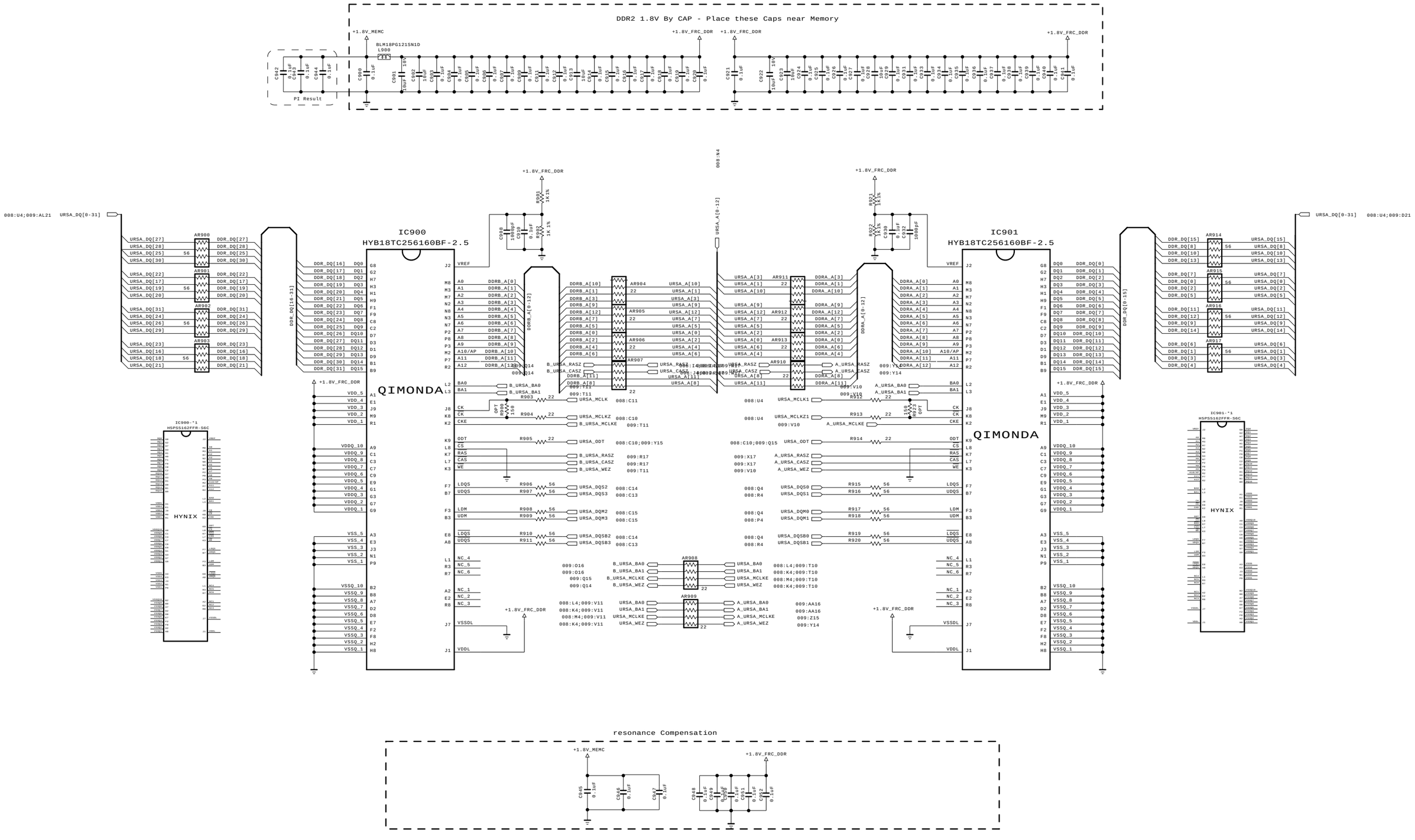
SECRET

LGElectronics

DO JAE GEUN

LG ELECTRONICS

MODEL	Mstar(MINERVA)	DATE	08.11.19
BLOCK	ETC SUB BOARD T/F	SHEET	14 / 15



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SECRET

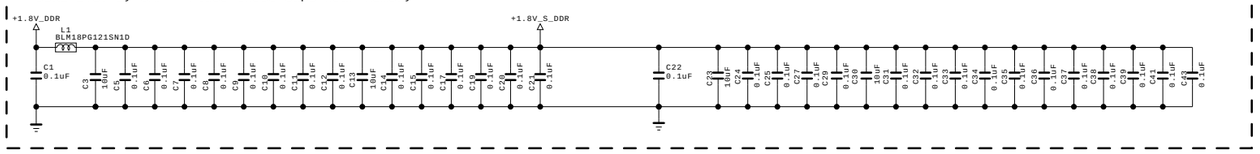
LGElectronics

HONG YEON HYUK

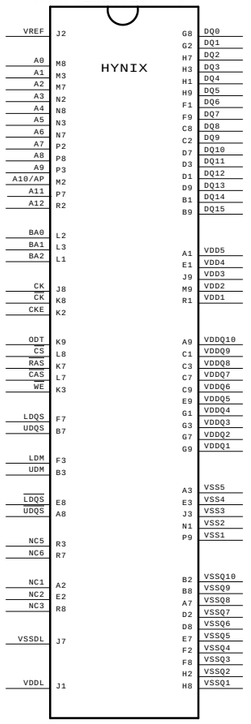
LG ELECTRONICS

MODEL	Mstar(JUPITER)	DATE	08.11.19
BLOCK	FRC DDR	SHEET	8 / 14

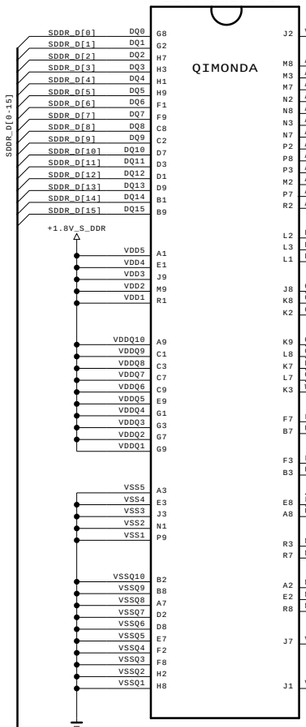
DDR2 1.8V By CAP - Place these Caps near Memory



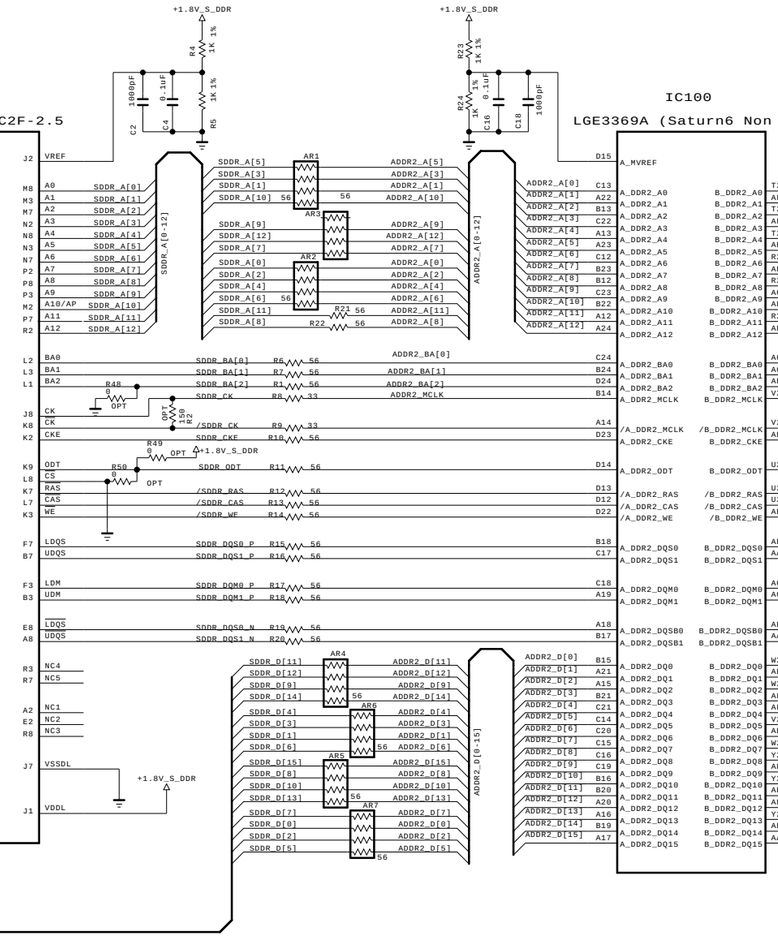
IC1-*1
HY5PS1G1631CFP-S6



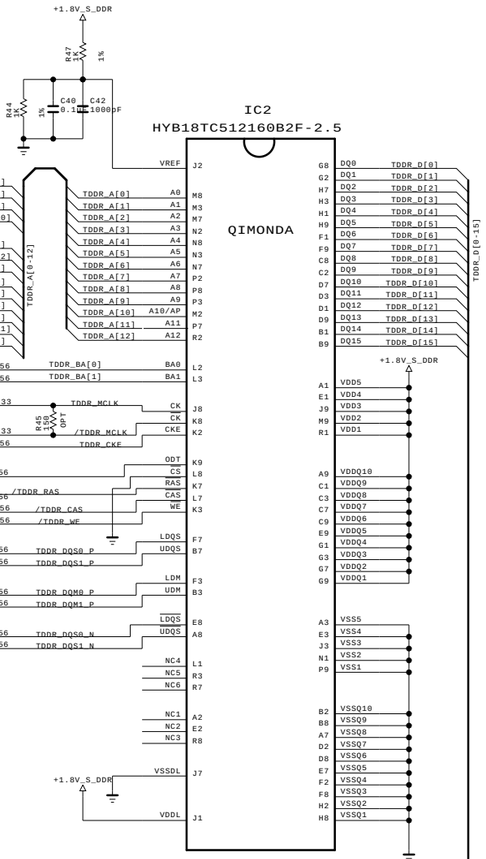
IC1
HYB18TC1G160C2F-2.5



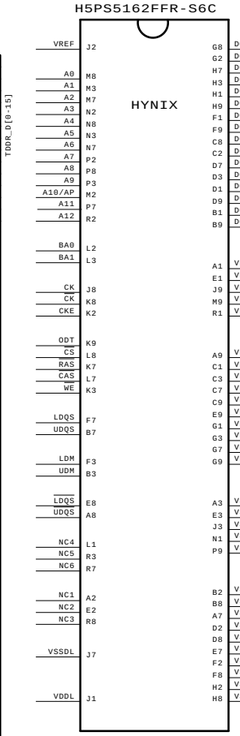
IC100
LGE3369A (Saturn6 Non RM)



IC2
HYB18TC512160B2F-2.5



IC2-*1
H5PS5162FFR-S6C



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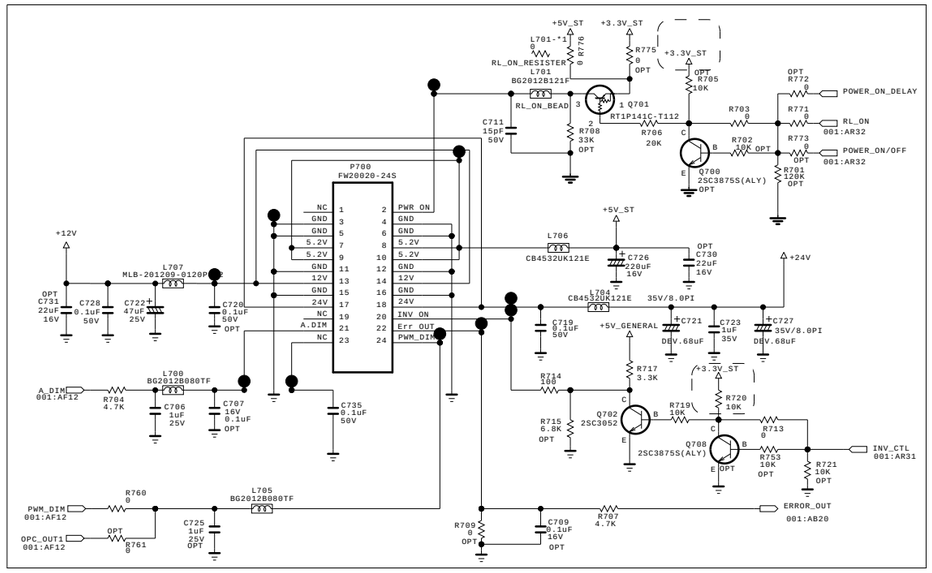
SECRET
LGElectronics

HONG YEON HYUK

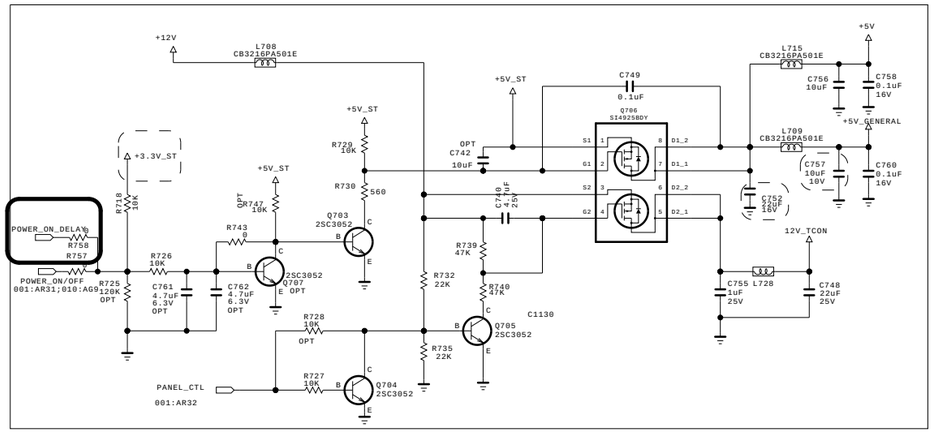
LG ELECTRONICS

MODEL	Mstar(JUPITER)	DATE	08.11.19
BLOCK	DDR2	SHEET	6 / 15

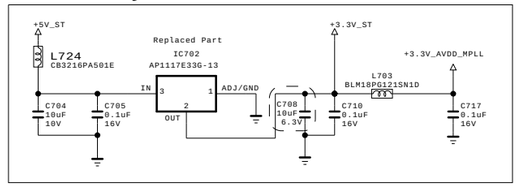
FROM LIPS & POWER B/D



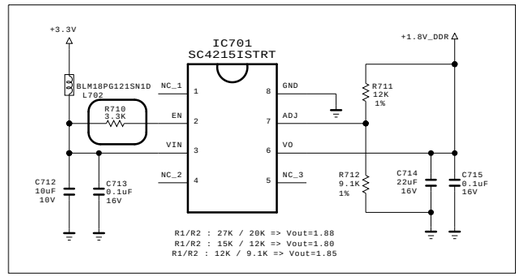
+5V_+12V



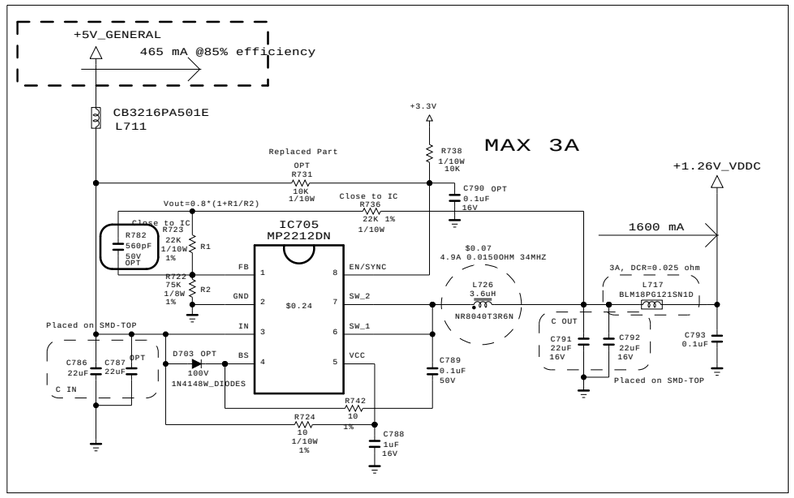
Stand-by +3.3V



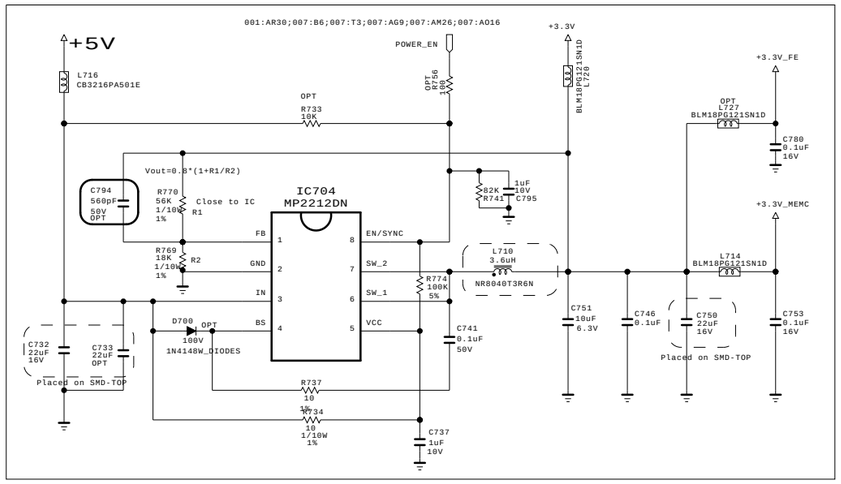
+1.8V for Saturn5 DDR



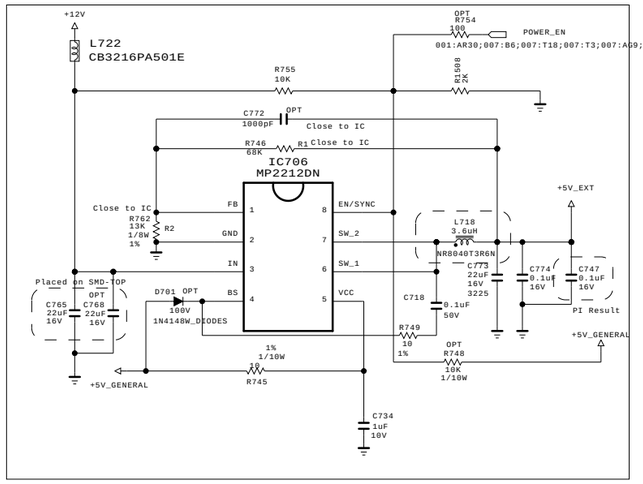
+1.26 Core for Saturn6



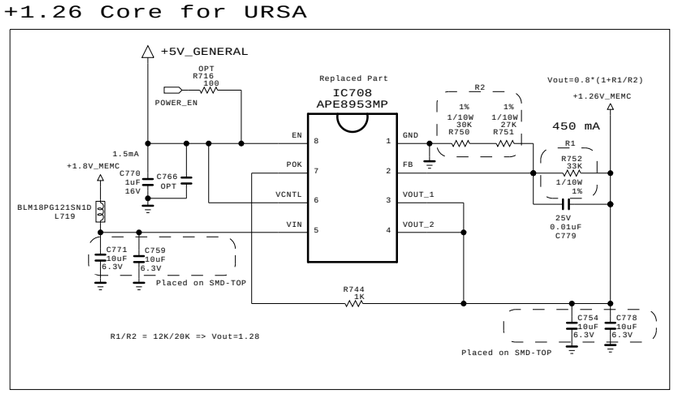
+3.3V



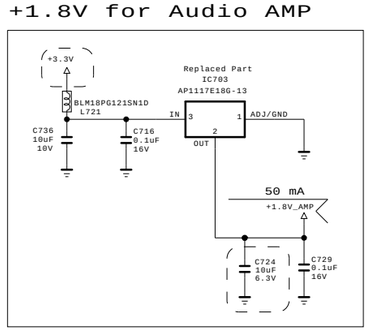
+5V_EXT



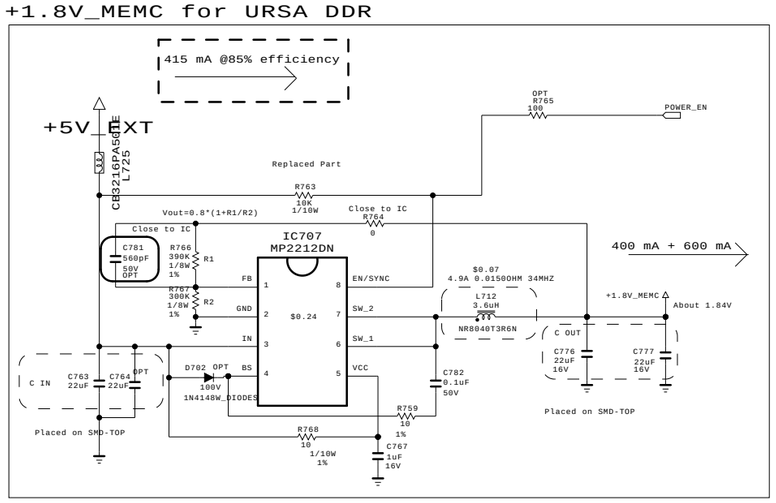
+1.26 Core for URSA



+1.8V for Audio AMP



+1.8V_MEMC for URSA DDR



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

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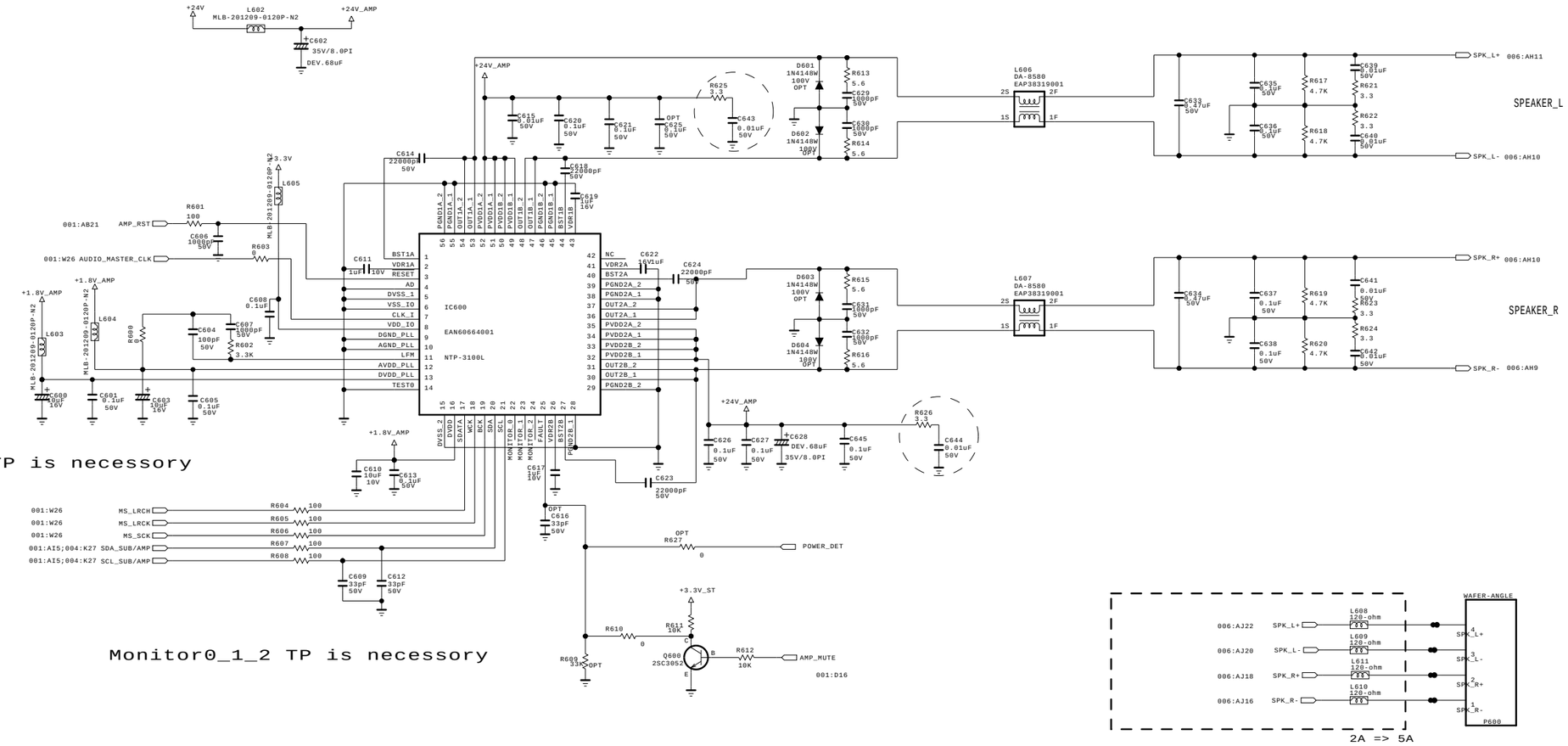
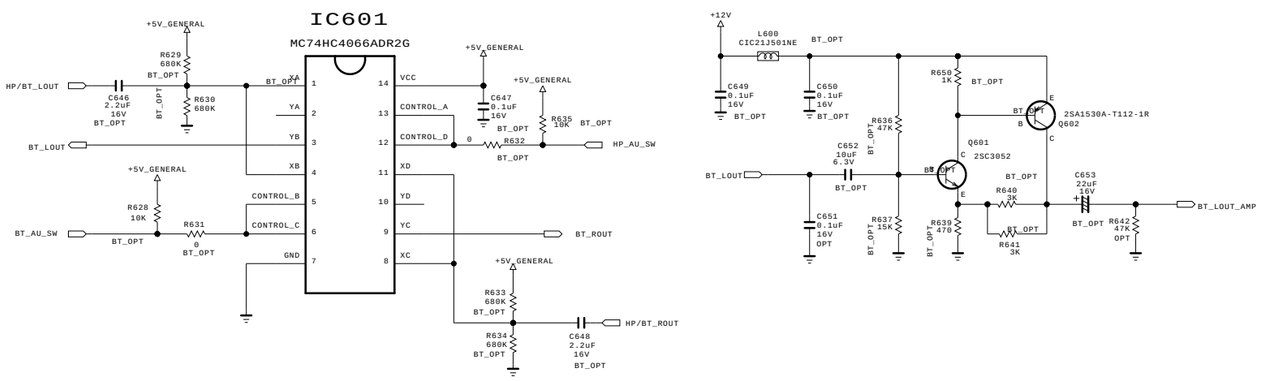
LG ELECTRONICS

MODEL	Mstar(JUPITER)	DATE	08.11.19
BLOCK	POWER	SHEET	4 / 15

AUDIO



BT & HP AUDIO SWITCH / AMP



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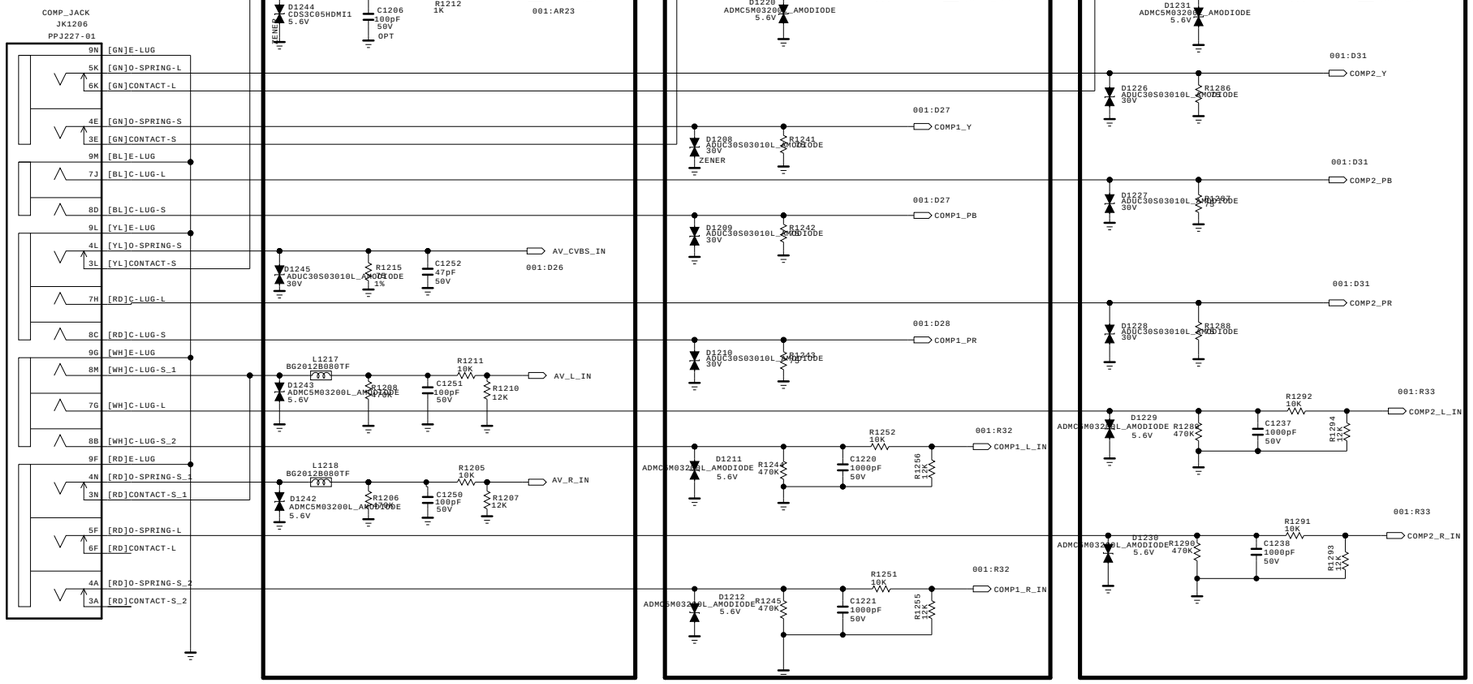
KIM JONG HYEUN

LG ELECTRONICS

MODEL	Mstar(JUPITER)	DATE	08.11.19
BLOCK	Audio	SHEET	3 / 15

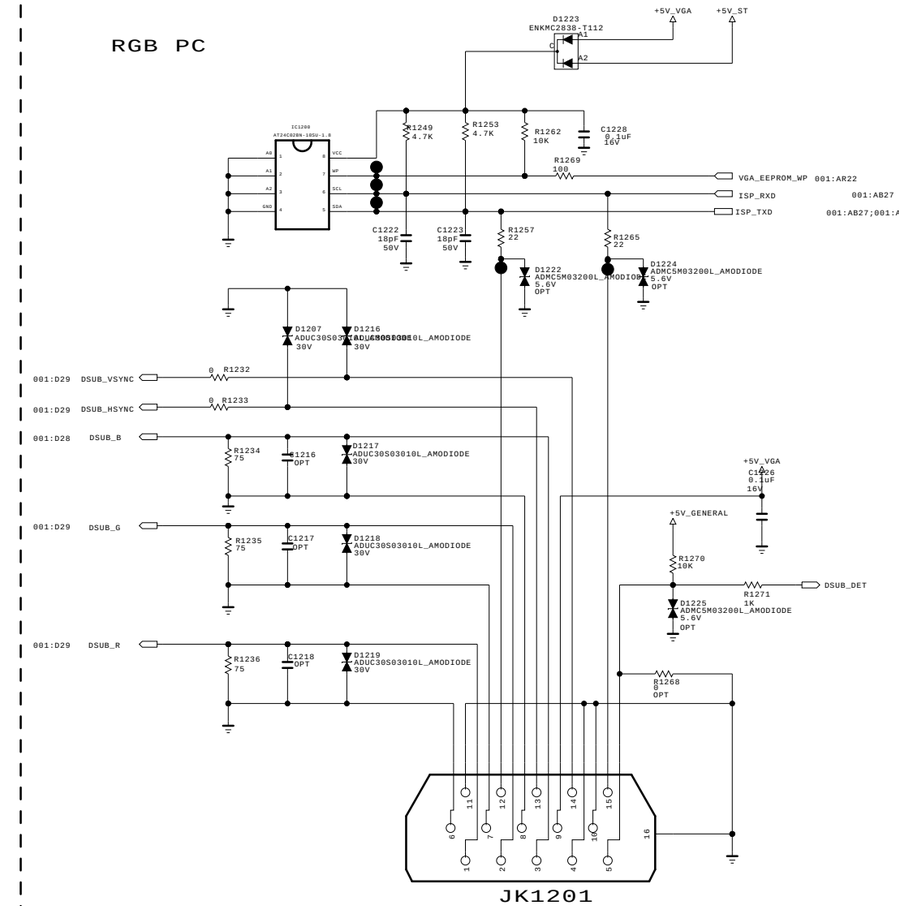
AV



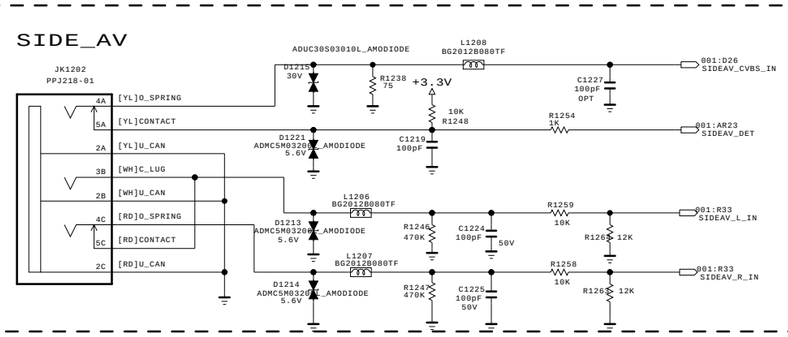
COMPONENT1

COMPONENT2

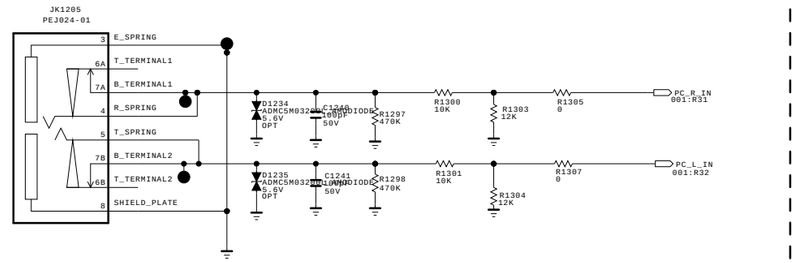
RGB PC



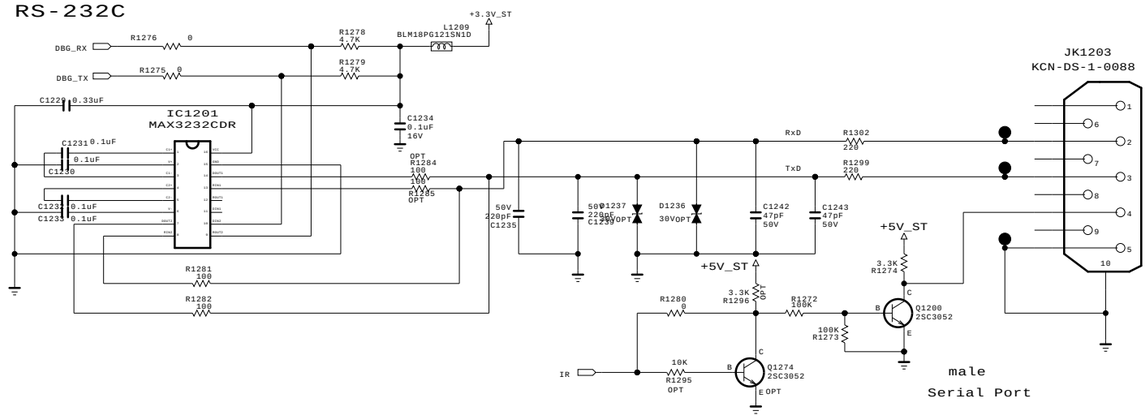
SIDE_AV



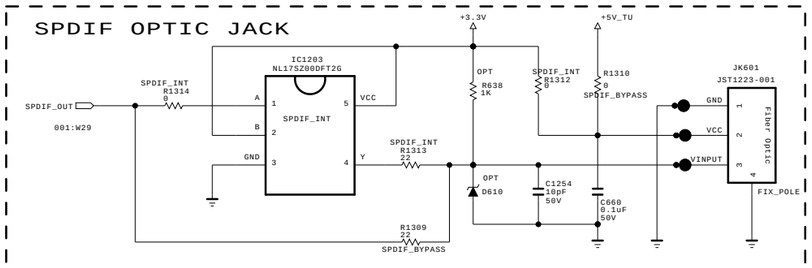
PC AUDIO



RS-232C



SPDIF OPTIC JACK



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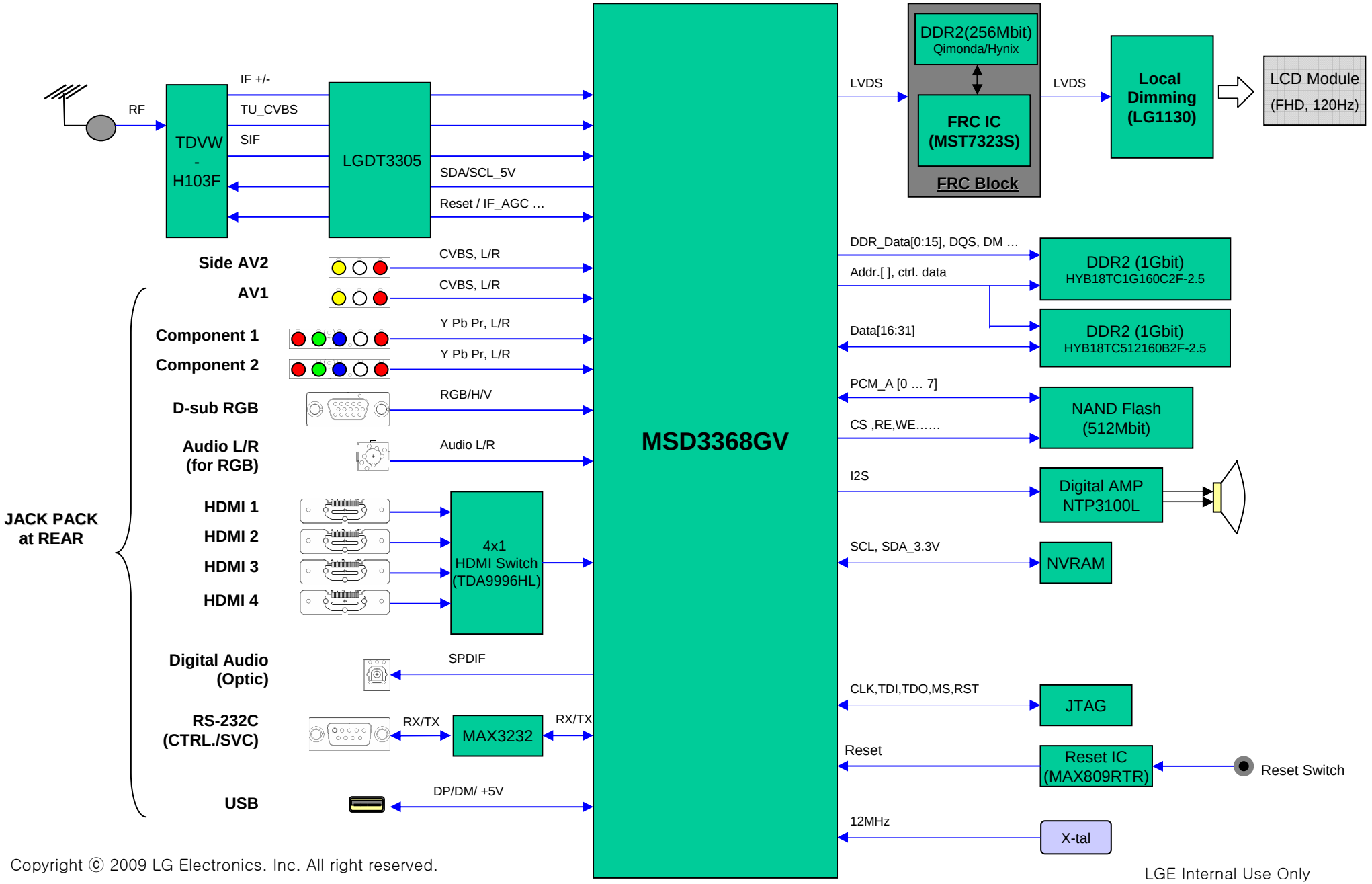
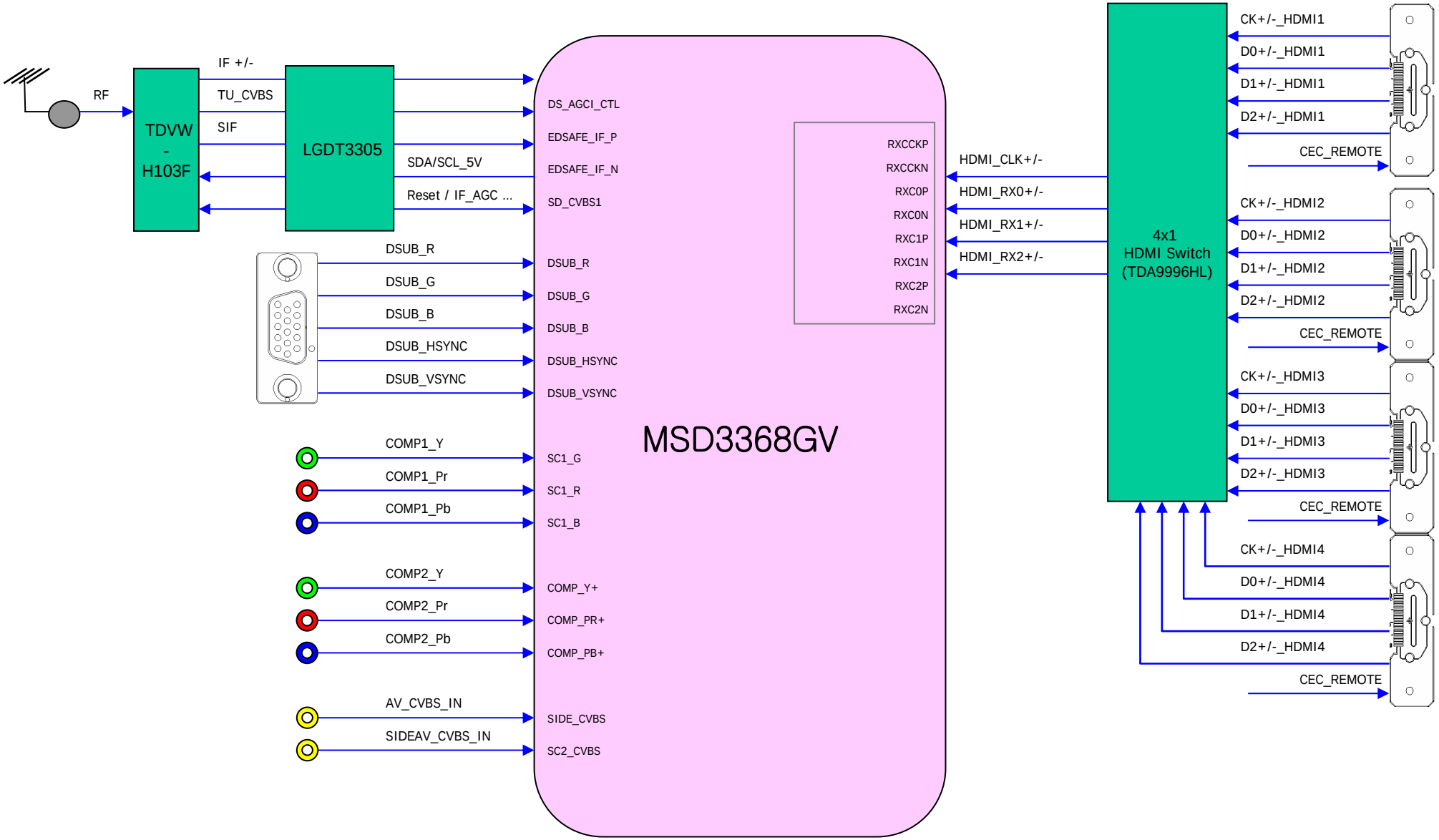
LG ELECTRONICS

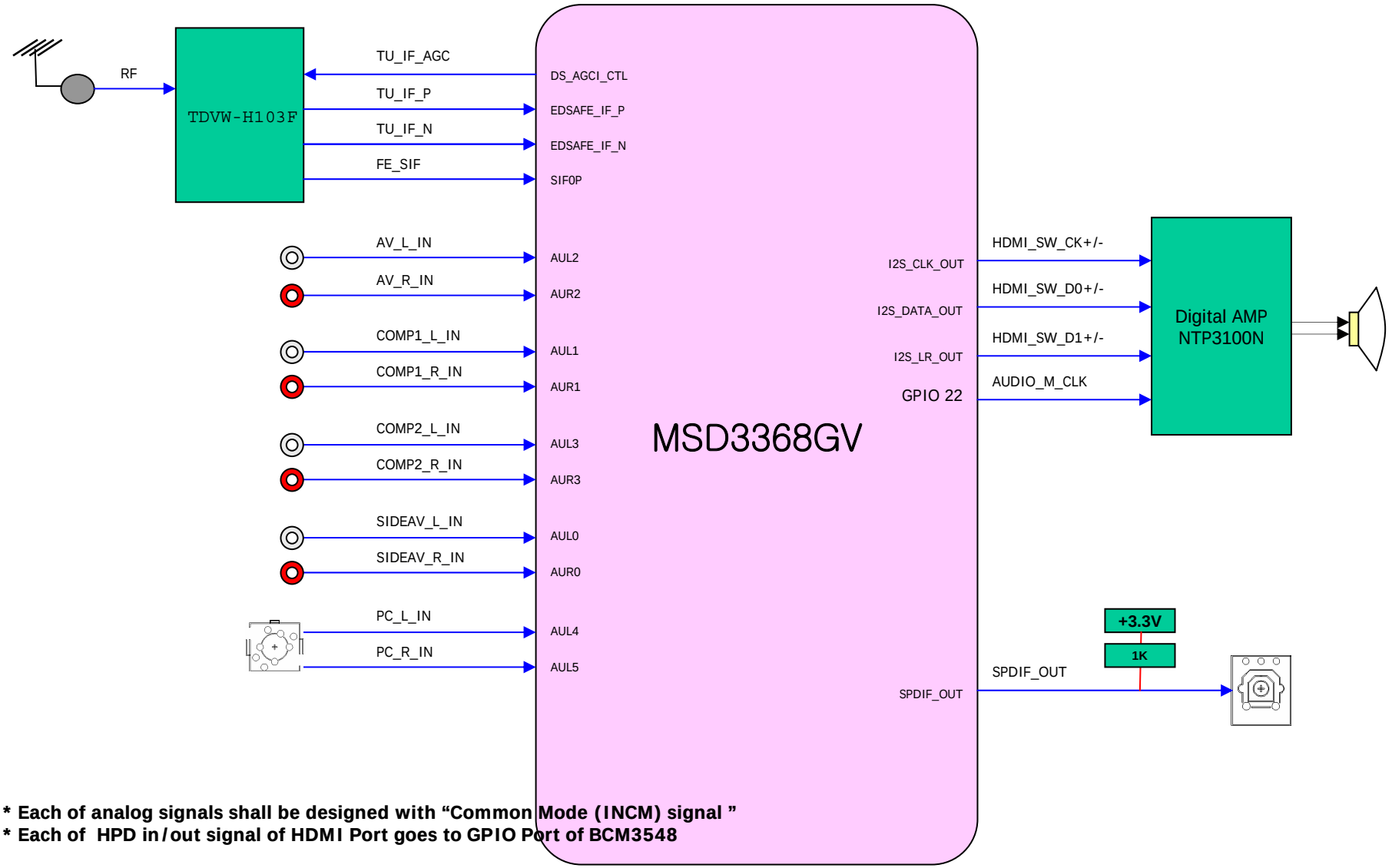
MODEL	Mstar(JUPITER	DATE	08.11.19
BLOCK	IN/OUT	SHEET	1 / 15



Video Signal Block

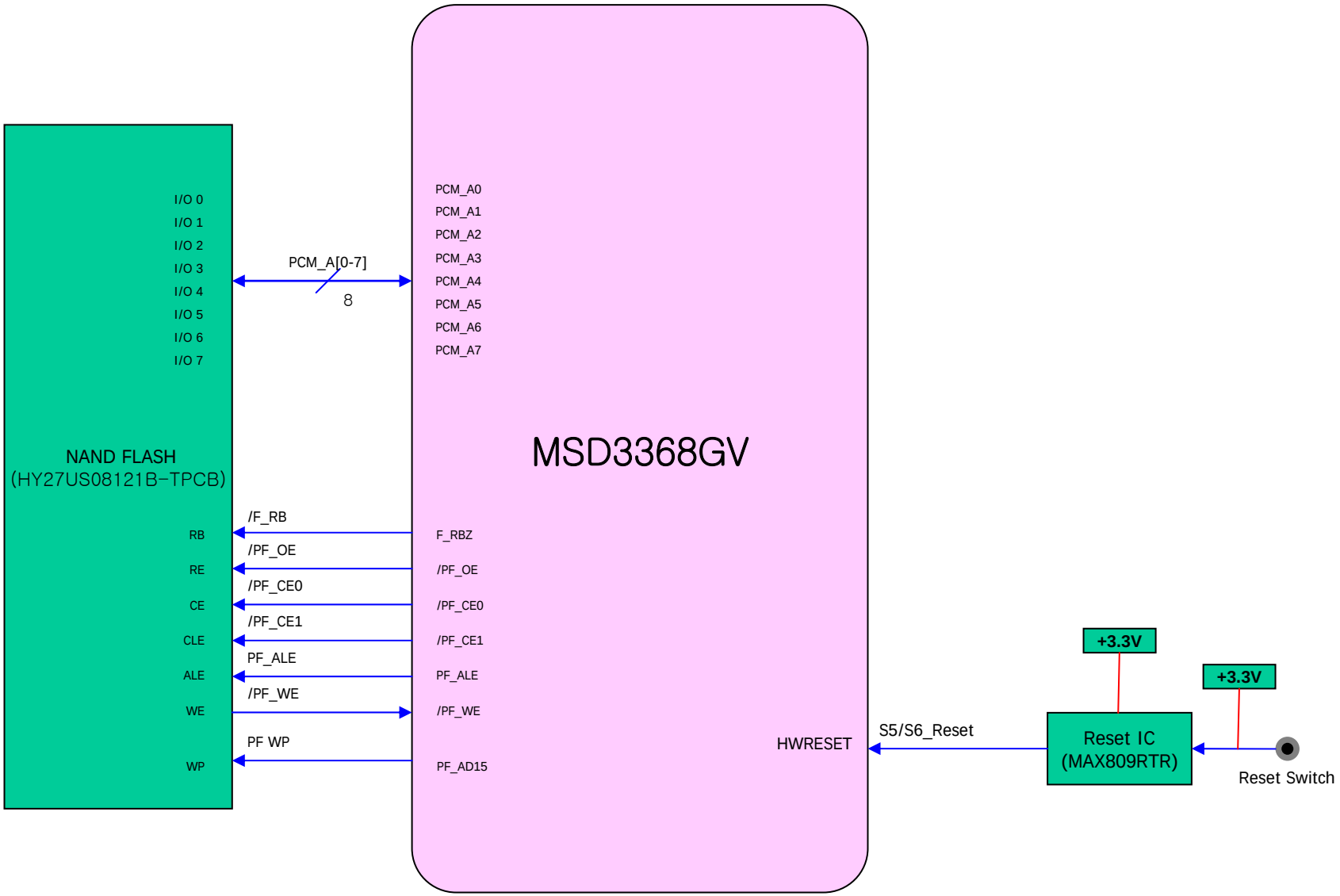


Audio Signal Block

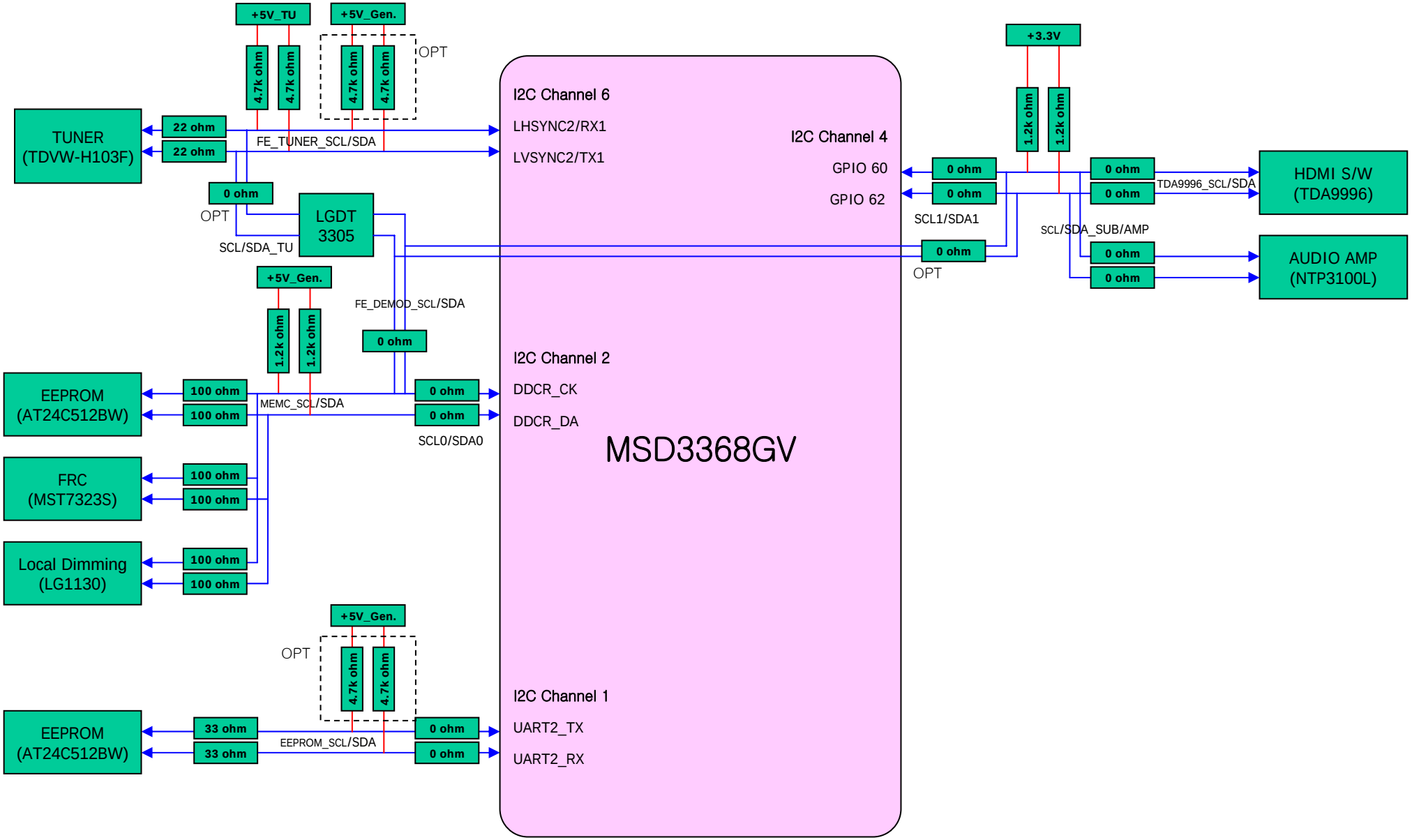


*** Each of analog signals shall be designed with “Common Mode (INCM) signal ”**
*** Each of HPD in/out signal of HDMI Port goes to GPIO Port of BCM3548**

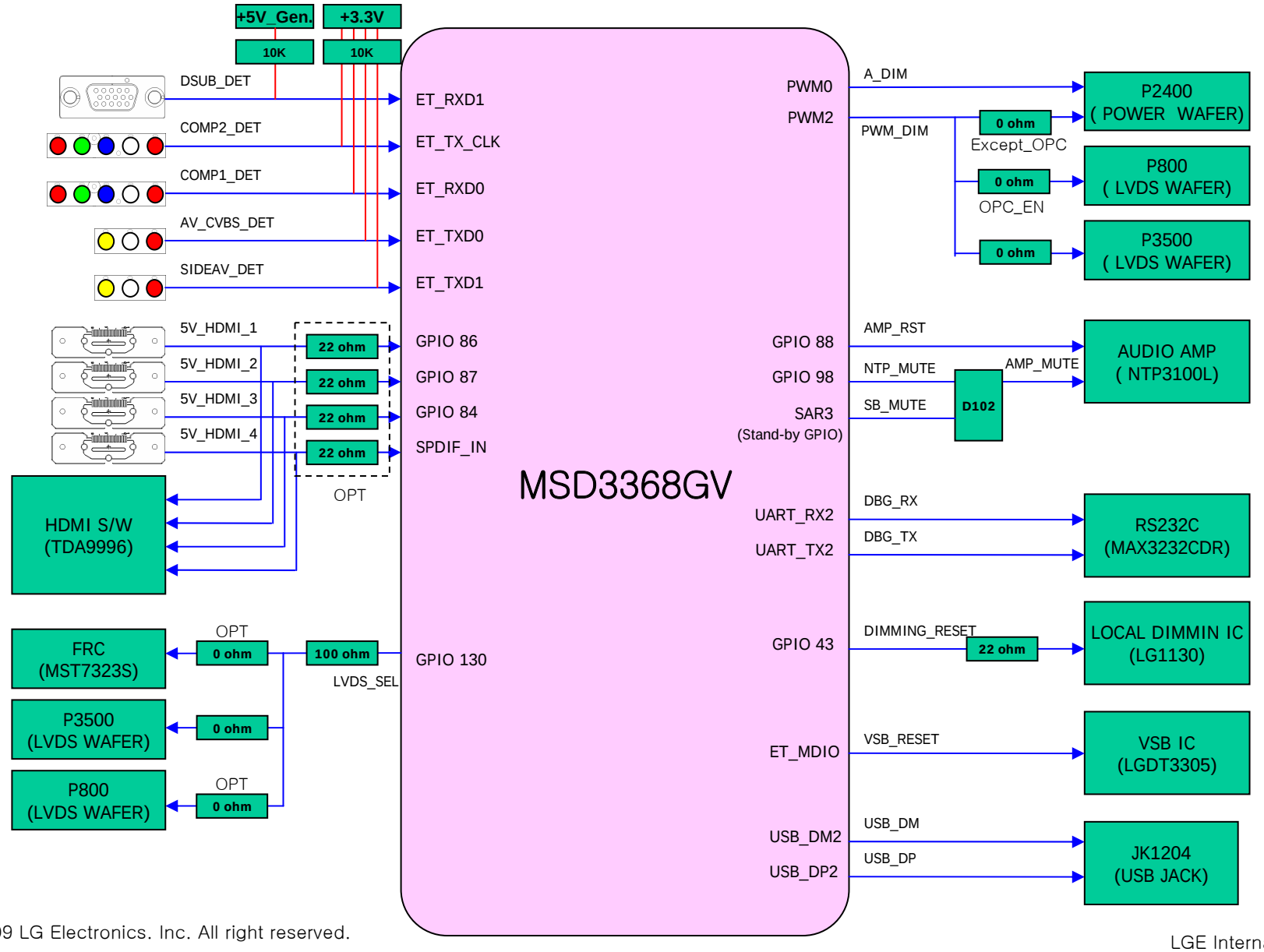
Flash & EJTAG Block



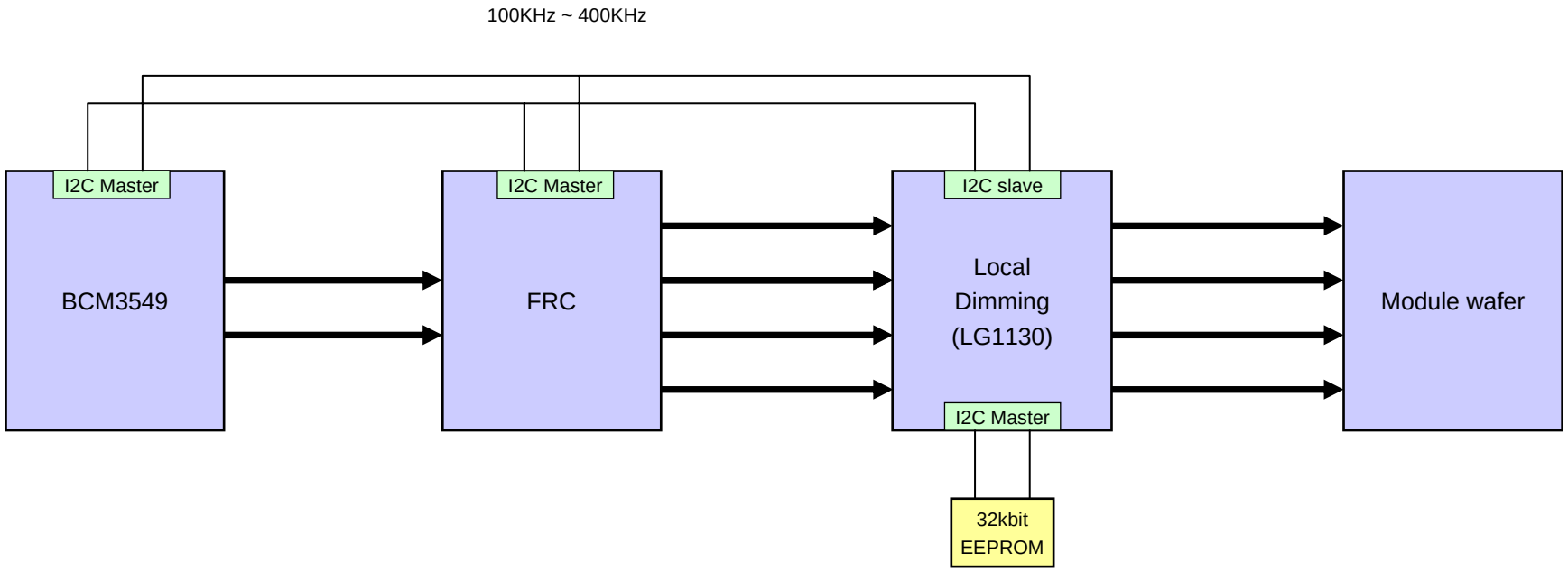
MSD3368 I2C Block



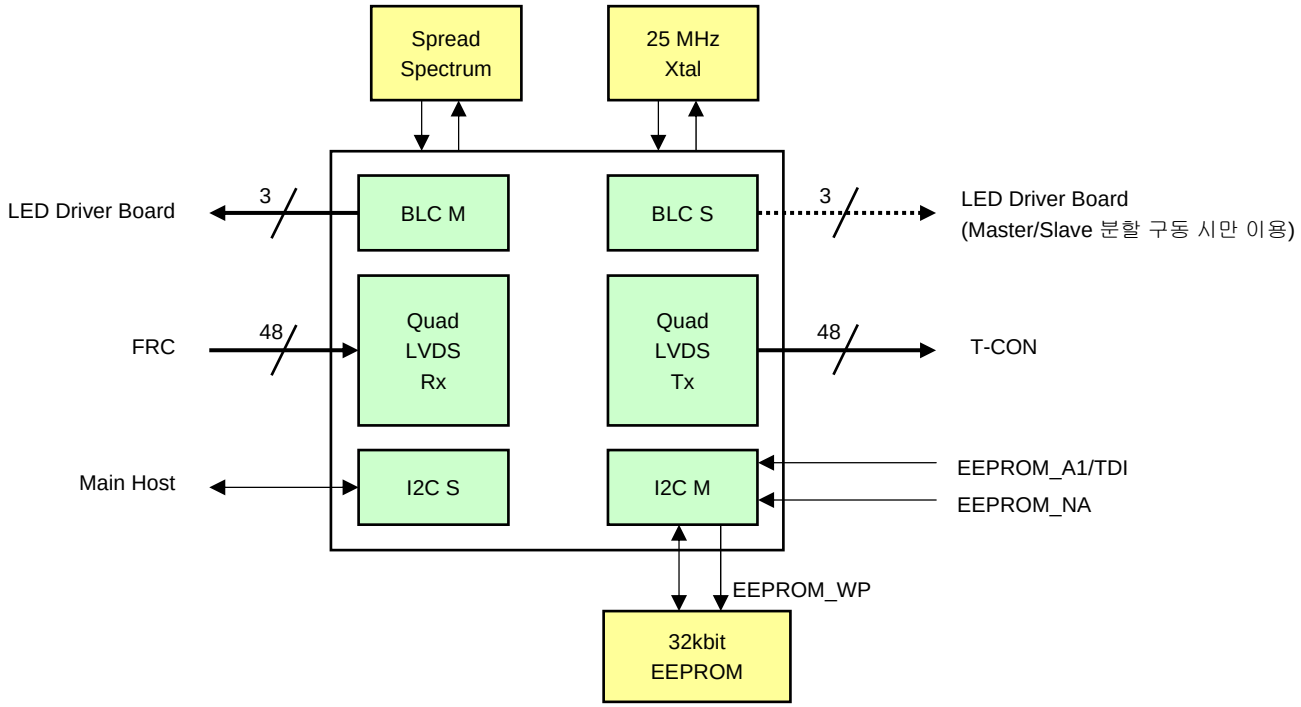
MSD3368 GPIO Block



LVDS 출력 Block



Local dimming Block

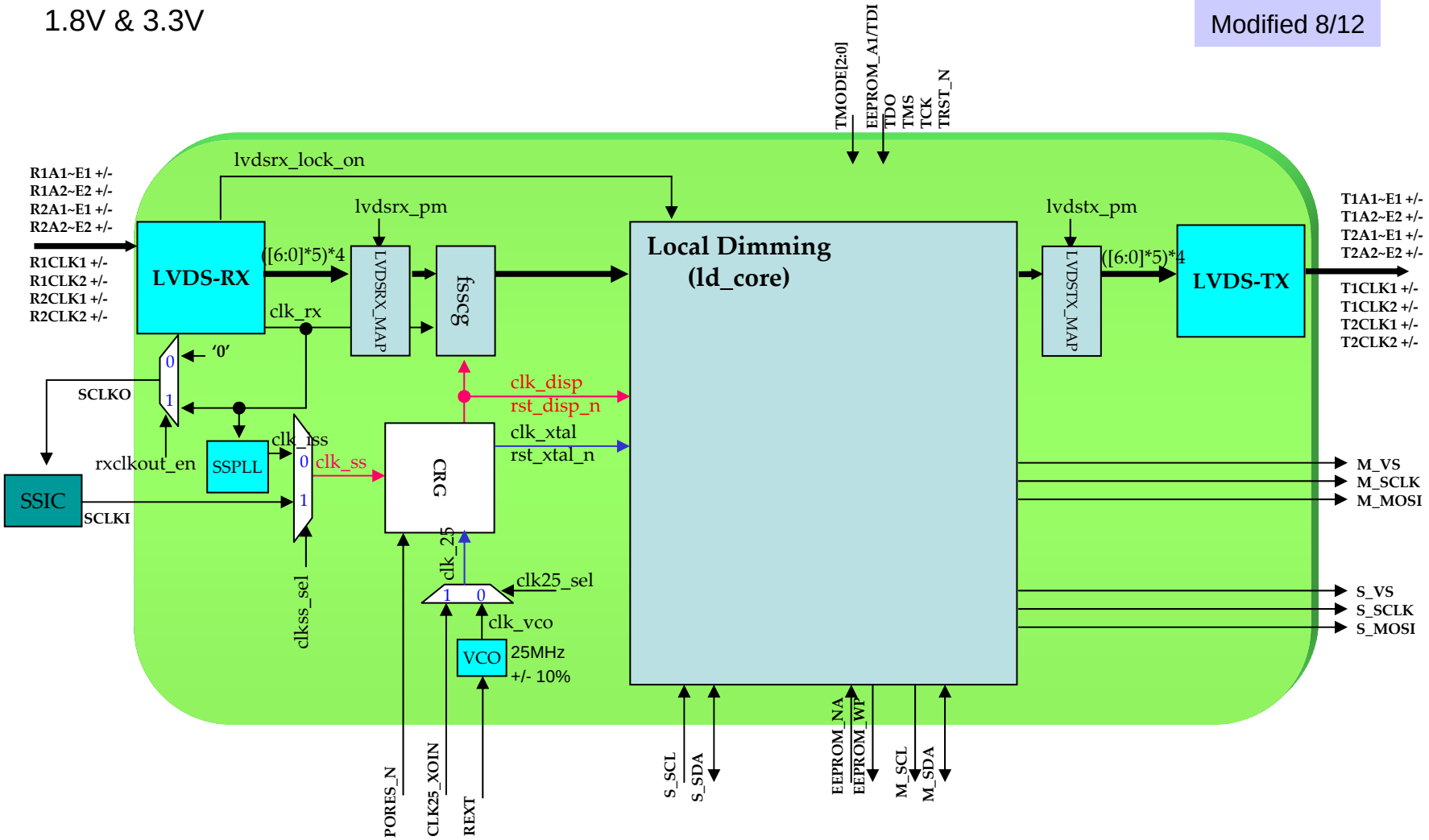


시스템을 꾸밀 때 선택적으로 이용할 수 있는 외부 IC들
(추가되는 IC없이 Local Dimming IC만으로 동작가능)

Local dimming Block

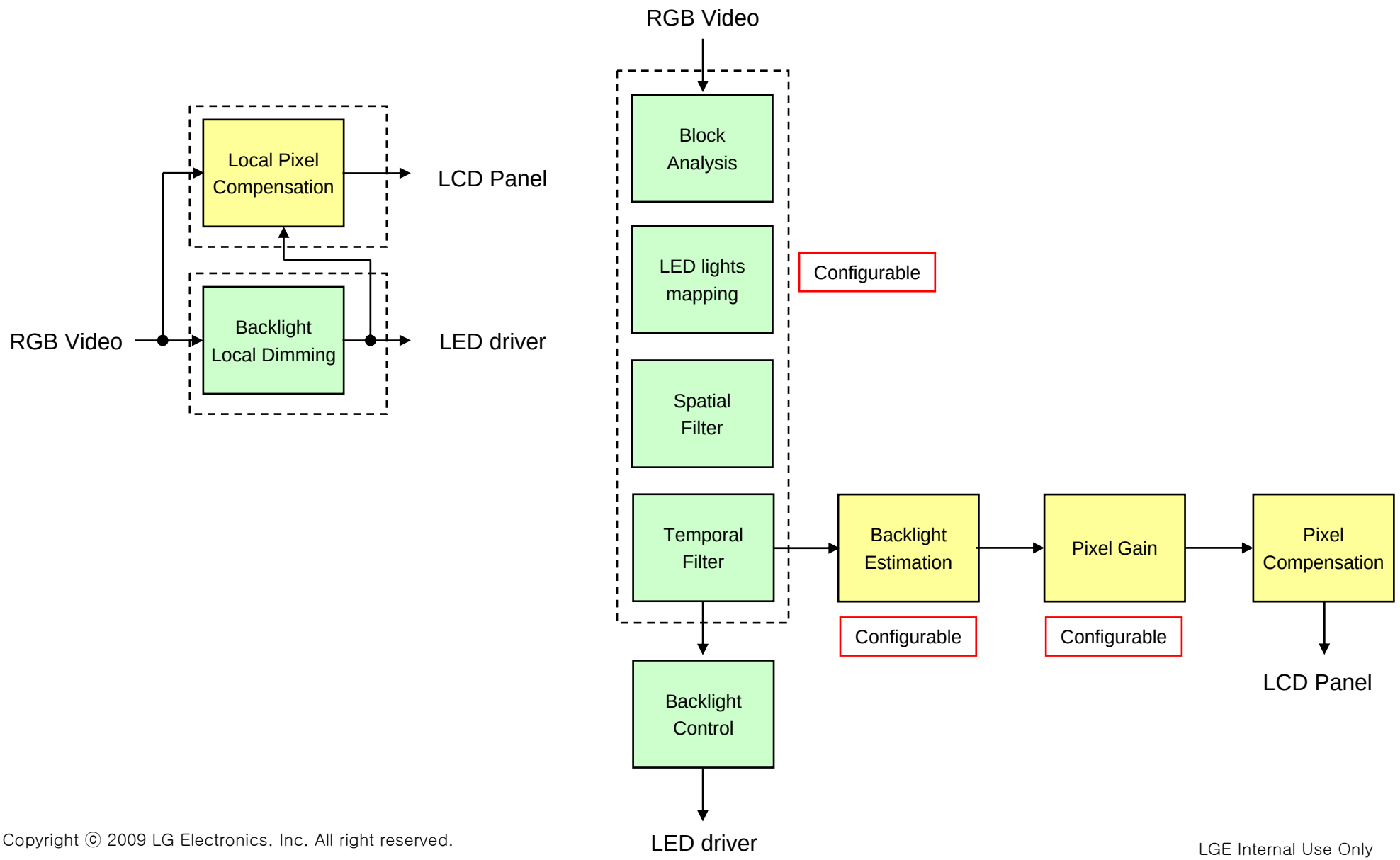
1.8V & 3.3V

Modified 8/12

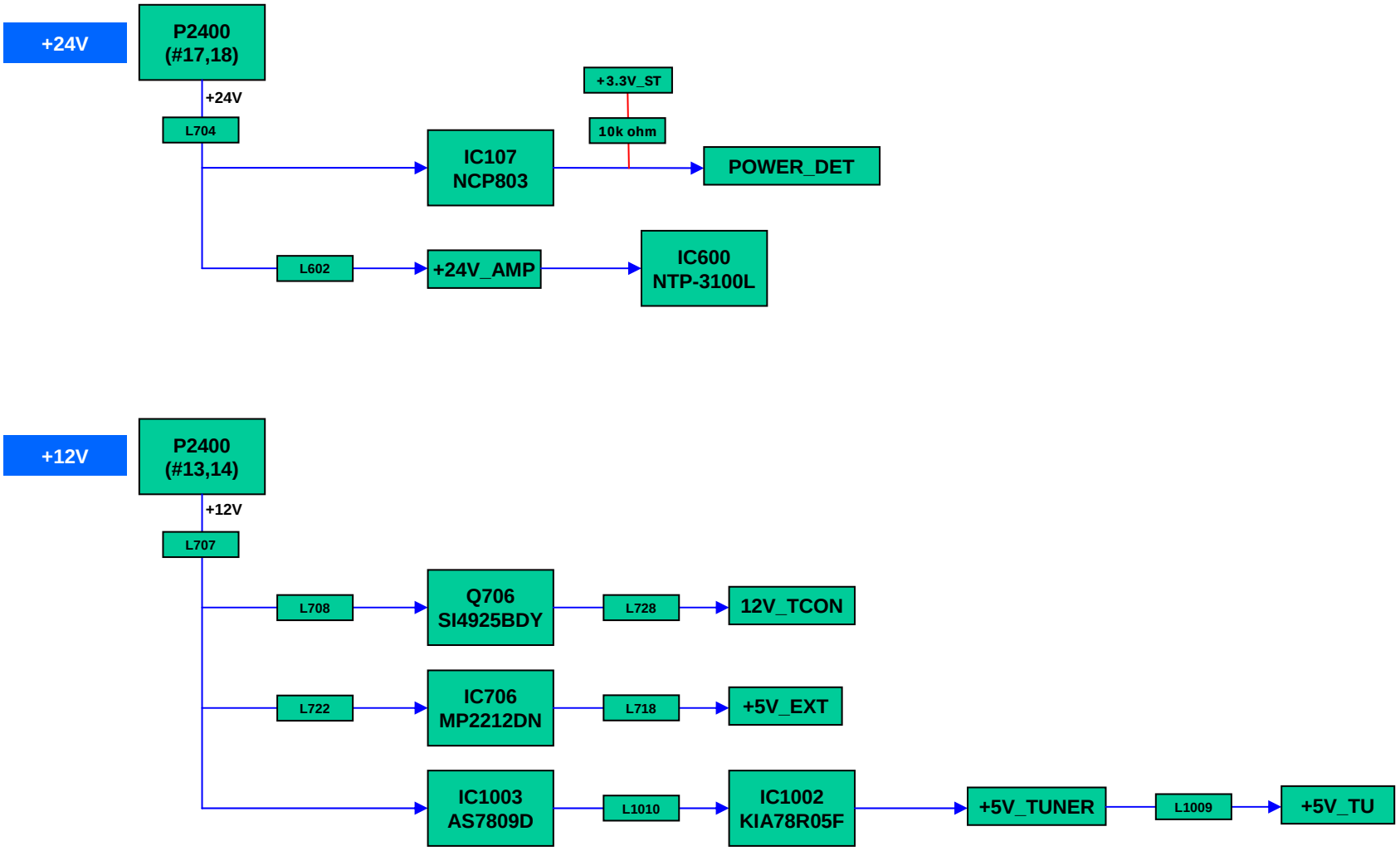


clk_xtal : I2C & BLC operation
clk_disp : Local Dimming Core operation

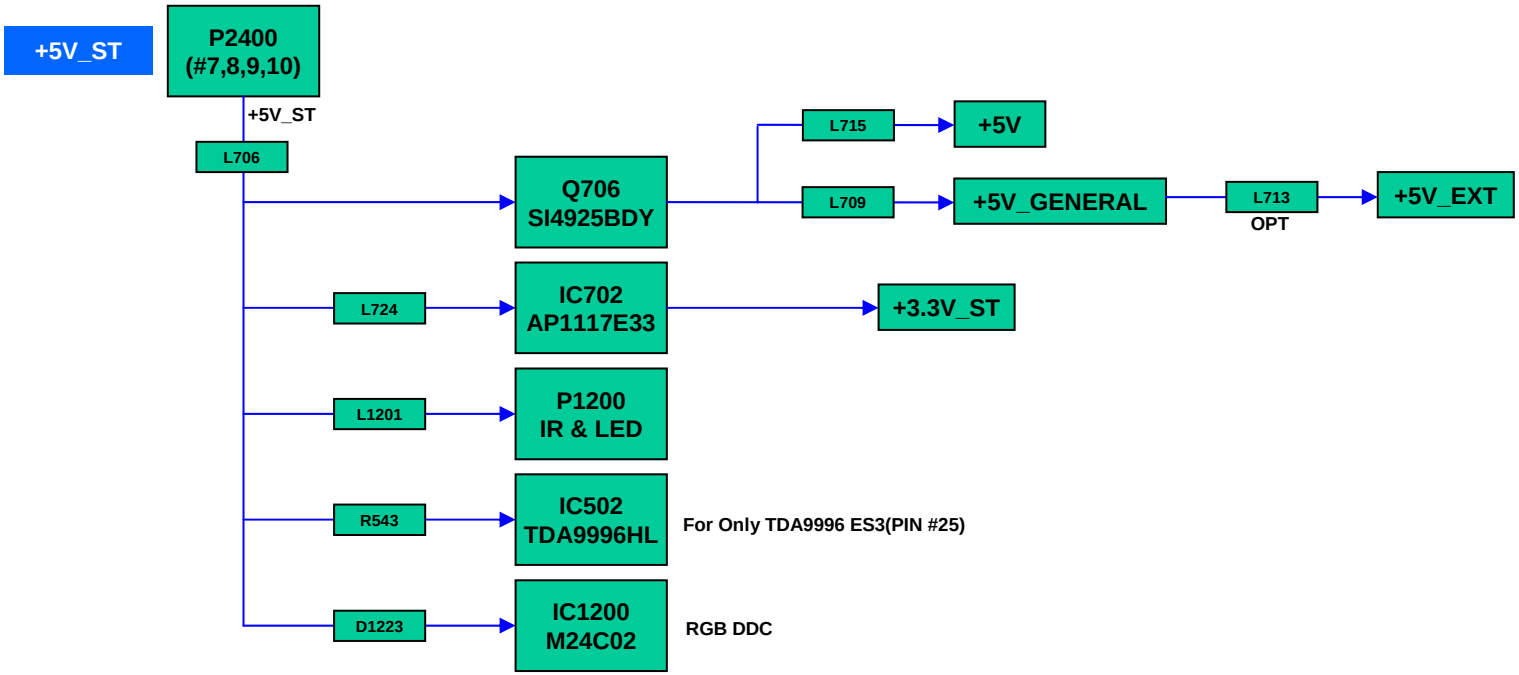
Local dimming Block

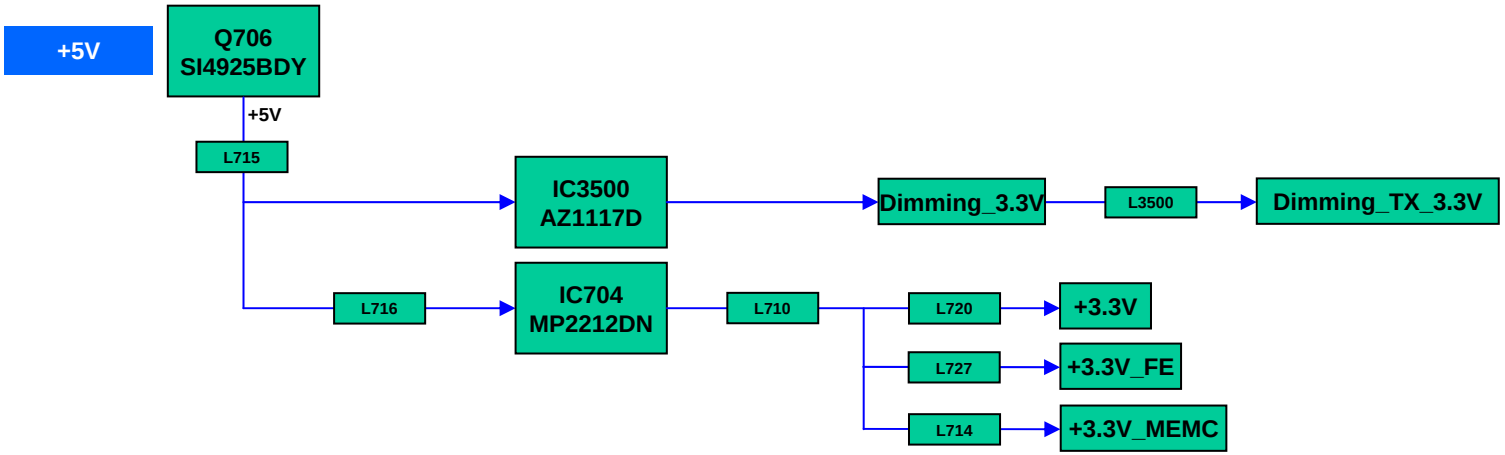


POWER Block (24V / 12V)

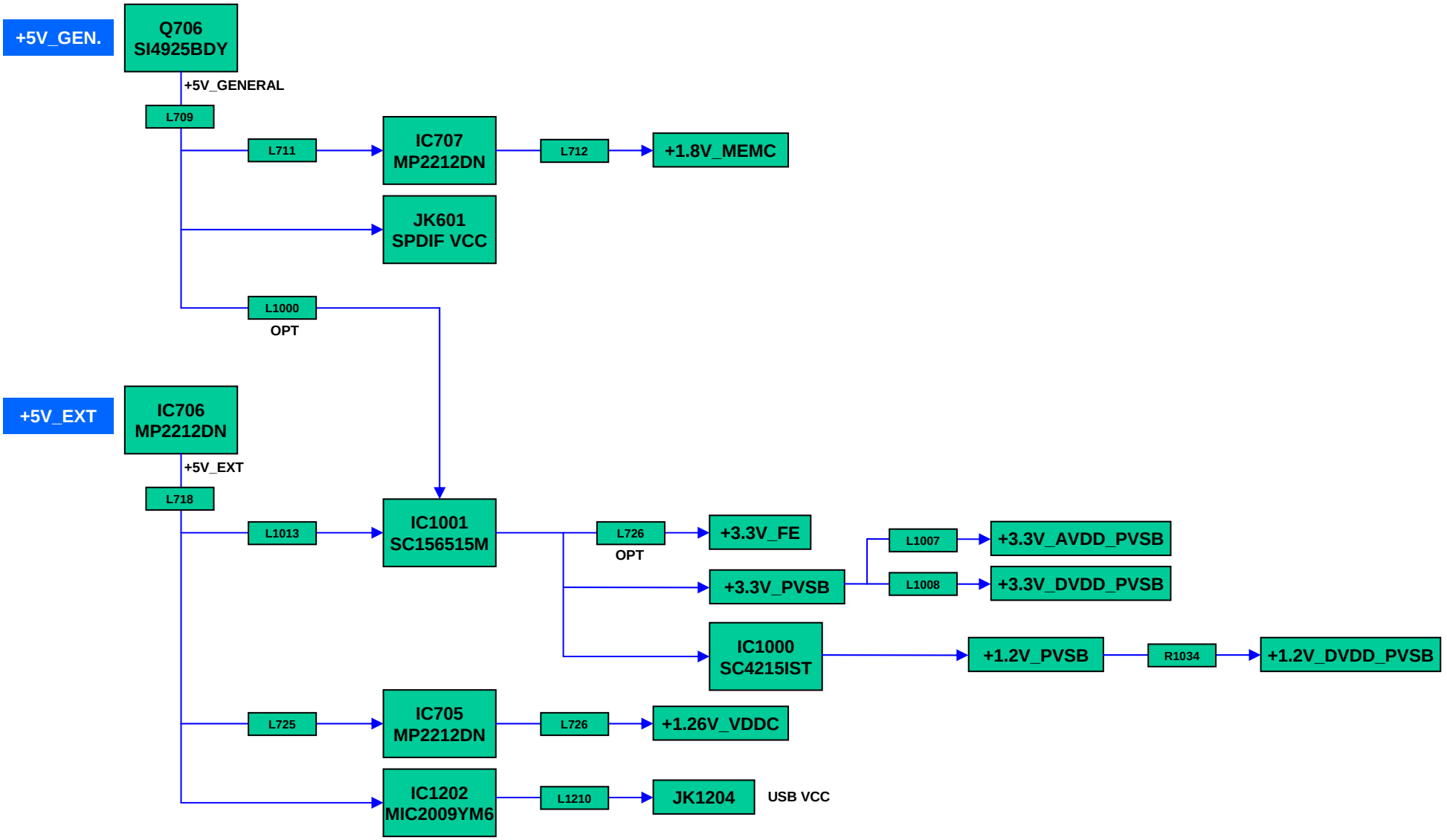


POWER Block (5V)

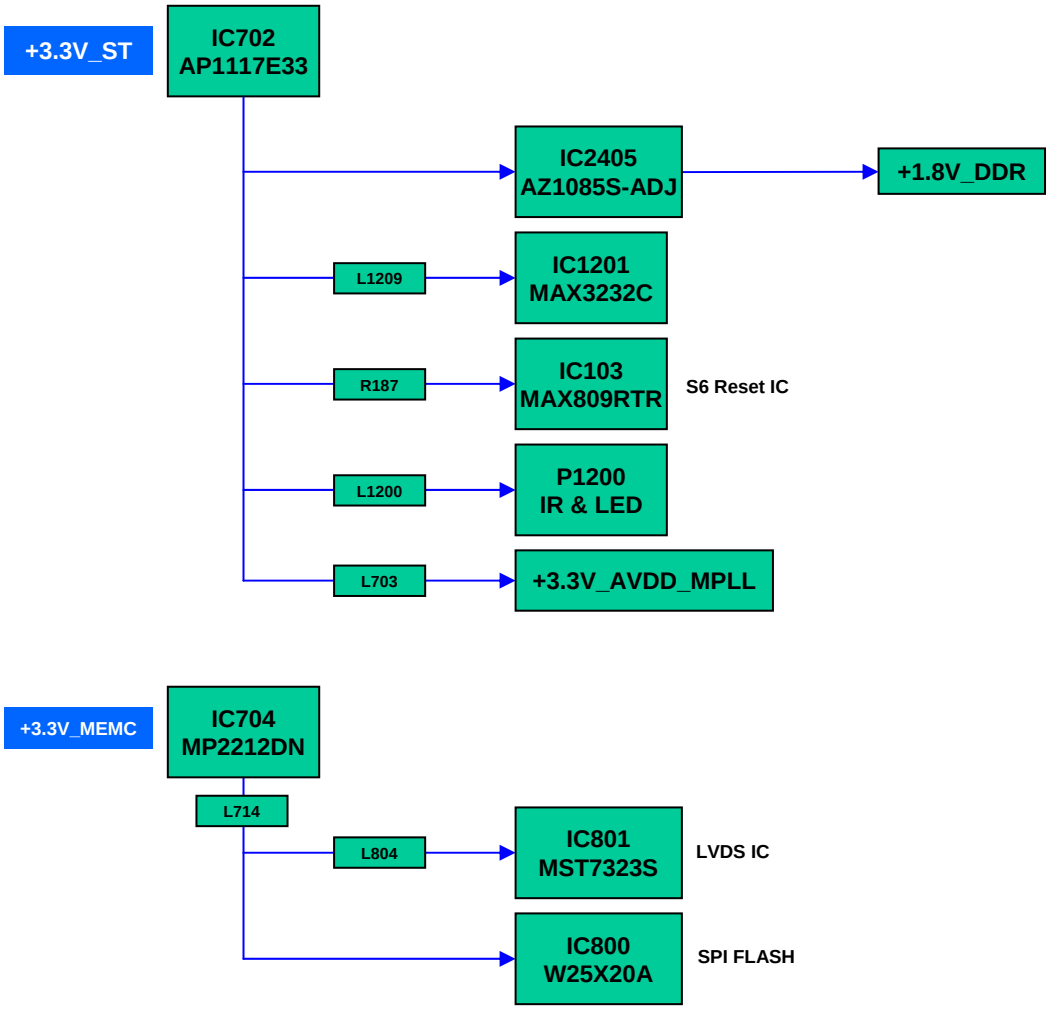




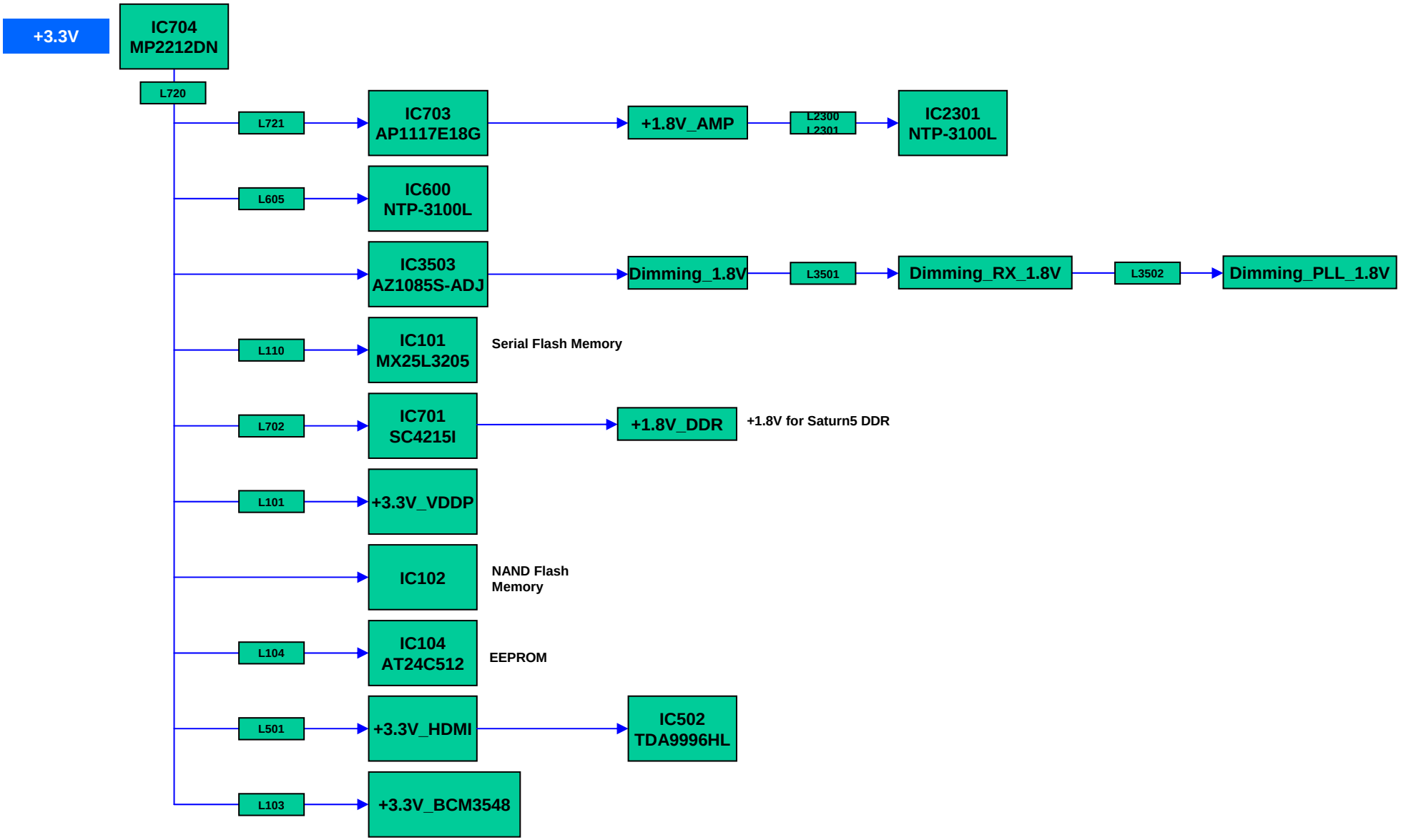
POWER Block (5V)

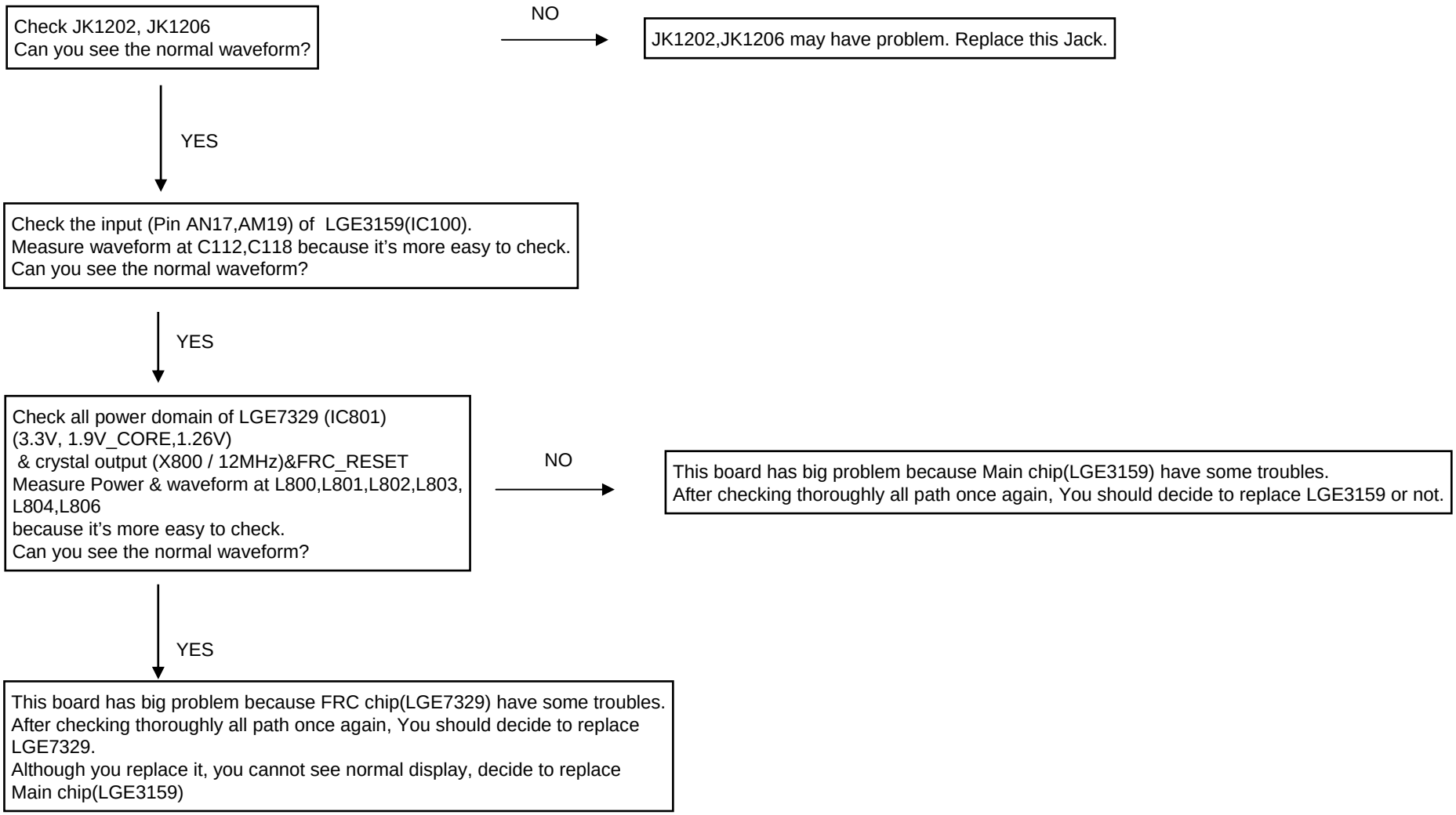


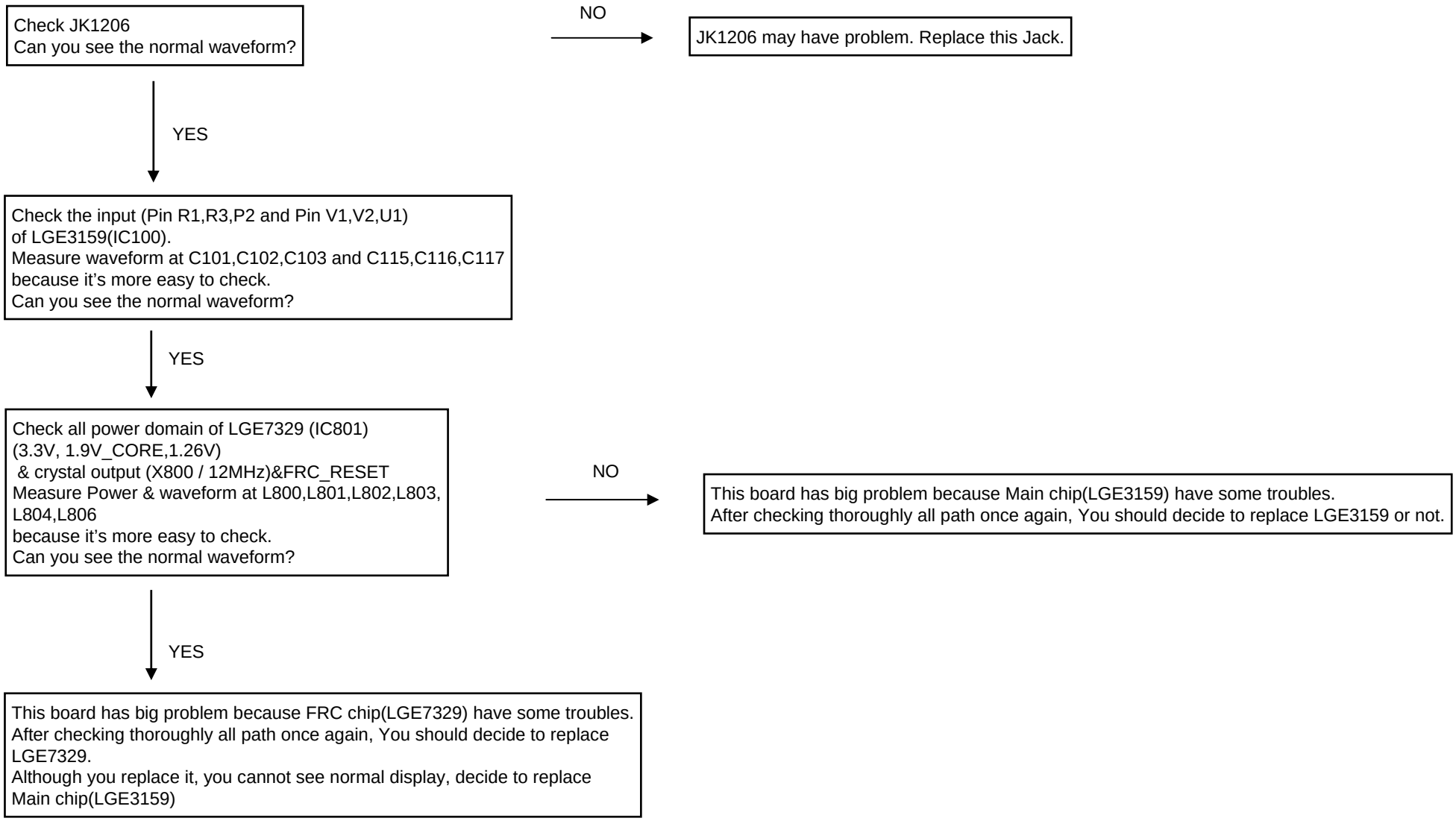
POWER Block (3.3V)

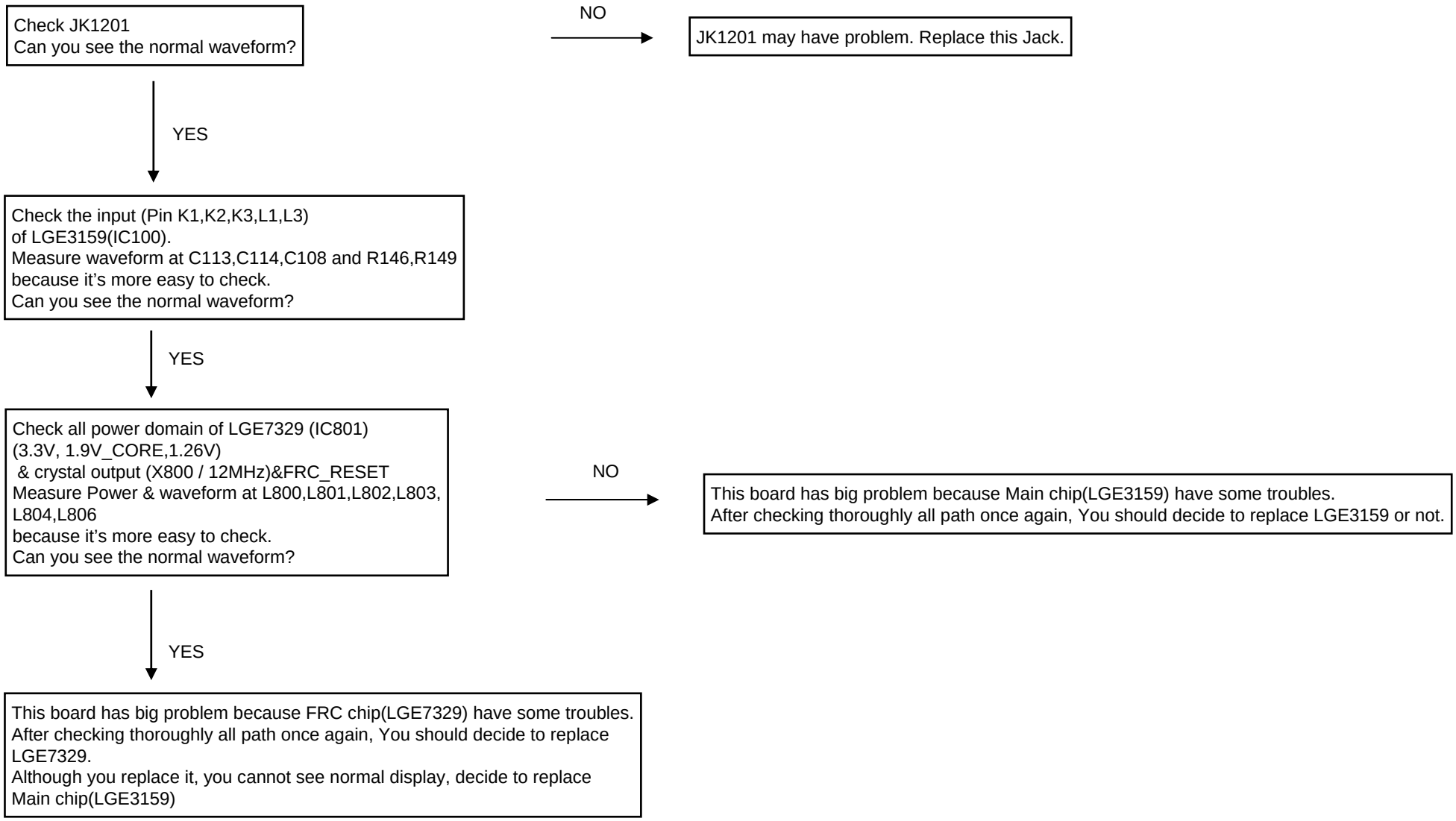


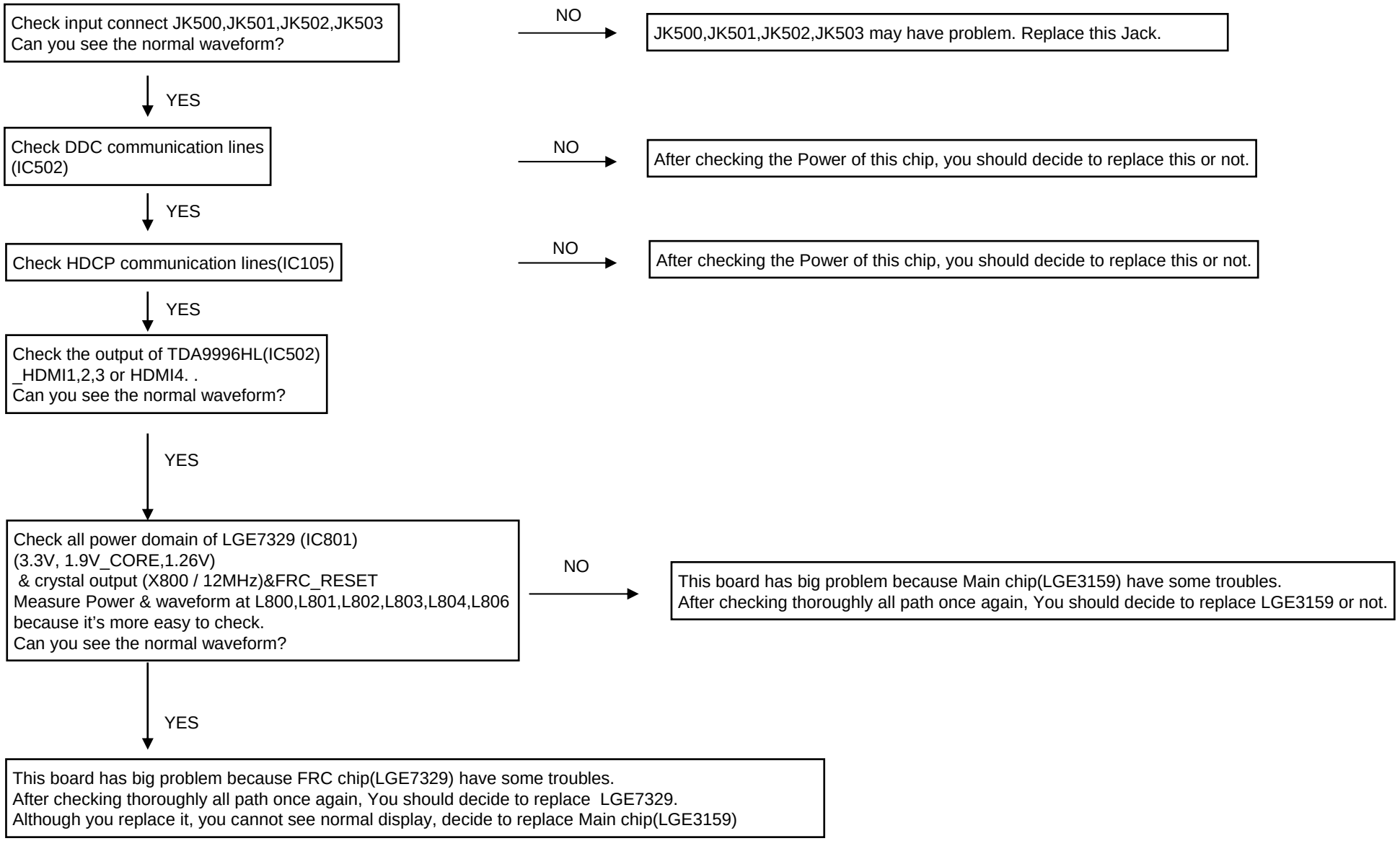
POWER Block (3.3V)

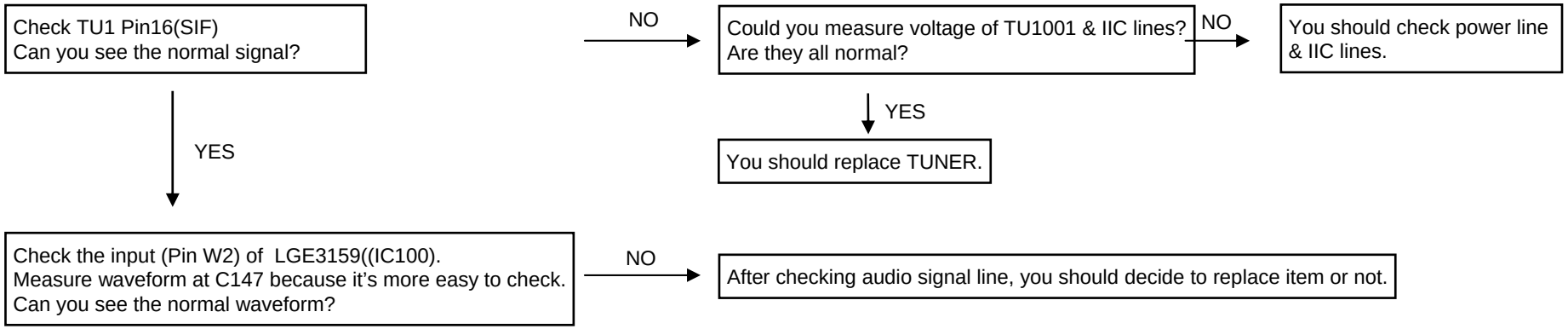












Check JK1206, JK1202, JK1205
Can you see the normal waveform?

NO → JK701, JK707, JK700, JK702, JK703 may have problem. Replace this Jack.

YES

Check the input (PinAA3,Y1,AE1,AF3,AE3,AE2,AA1
AB1,AB2,AC2,AB3,AC3) of LGE3159(IC100).
Can you see the normal waveform?

NO → After checking audio signal line, you should decide to replace item or not.

YES

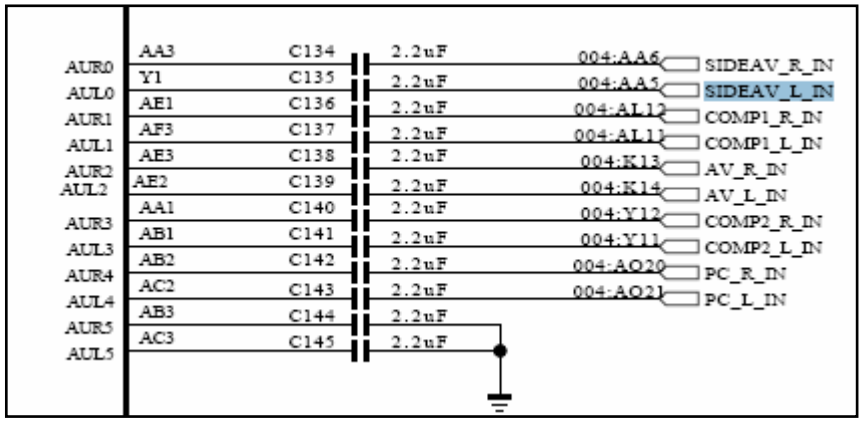
Check the Output (Pin Audio_MASTER_CLK ,MS_LRCK
MS_SCK,MS_LRCH) of LGE3159(IC100).
Can you see the normal waveform?

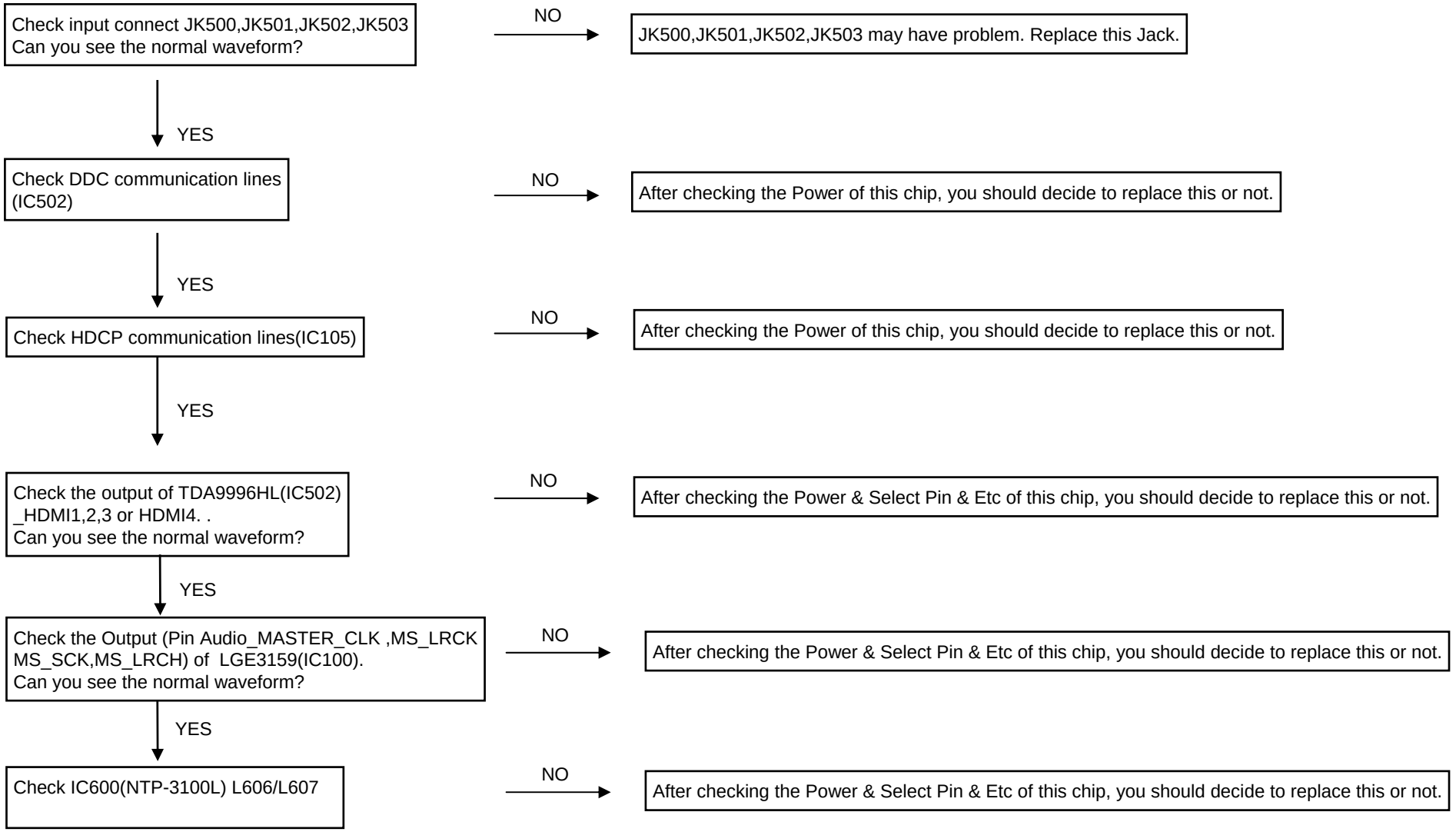
NO → After checking audio signal line, you should decide to replace item or not.

YES

Check IC600(NTP-3100L) L606/L607

NO → After checking audio signal line, you should decide to replace item or not.





Check the output (Pin A8,B7,C7,D8) of LGE3159(IC100).
Measure waveform at R160,R161,R162,R163 because it's more easy to check.
Can you see the normal signal?

NO → This board has big problem because Main chip(BCM3553) have some troubles.
After checking thoroughly all path once again, You should decide to replace BCM3553 or not.

YES ↓

Check the input (Pin 7,17,18,19) of NTP3100((IC600).
Can you see the normal waveform?

NO → After checking audio signal line, you should decide to replace item or not.

YES ↓

Check the Output (Pin Audio_MASTER_CLK ,MS_LRCK
MS_SCK,MS_LRCH) of LGE3159(IC100).
Can you see the normal waveform?

NO → After checking the Power & I2C & Reset of this chip, you should decide to replace this or not.

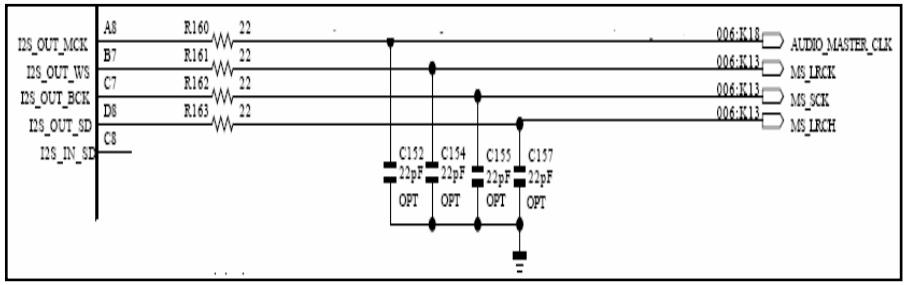
YES ↓

Check IC600(NTP-3100L) L606/L607

NO → After checking audio signal line, you should decide to replace item or not.

YES ↓

Check the connector & Speaker



Check the output (Pin E9) of LGE3159(IC100).
Measure waveform at R159 because it's more easy to check.
Can you see the normal signal?

NO → This board has big problem because Main chip(LGE3159) have some troubles.
After checking thoroughly all path once again, You should decide to replace LGE3159 or not.

YES ↓

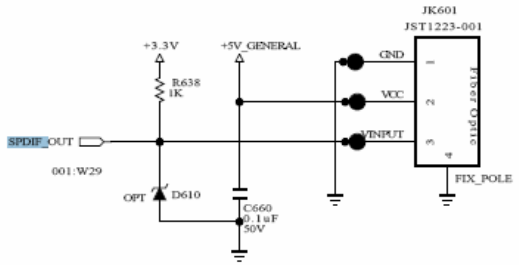
Check the input of JK601.
Can you see the normal waveform?

NO → After checking audio signal line, you should decide to replace item or not.

YES ↓

After checking the Jack, you should decide to replace item or not.

SPDIF OPTIC JACK

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